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The Role of Federal Funding Programs in Canada's Species-at-risk Conservation Strategy (March 2024)

Author: Vikram Suresh Iyer Employer: Canadian Wildlife Service

Abstract

This report analyzed the role of federal conservation funding programs in Canada's primary species-at-risk (SAR) conservation strategy over the next five years, namely the "Pan-Canadian Approach to Transforming Species at Risk Conservation in Canada". This was done by exploring the research question: "How well do federal funding programs incorporate the principles of Canada's species-at-risk conservation strategy?". The Habitat Stewardship Program (HSP), the Aboriginal Fund for Species at Risk (AFSAR), and the Critical Habitat Interdepartmental Program (CHIP) are the three long-term federal funding programs which fund SAR conservation projects in Canada. A combination of public information and project metrics from each program was used to answer ten assessment questions to determine how well they have each incorporated the principles of the Pan-Canadian approach. The results suggest that HSP, AFSAR, and CHIP have incorporated 79%, 85%, and 75% of the principles described in the strategy, respectively, for an average of 78% when taken together. Recommendations to better incorporate the strategy include providing more monitoring and research opportunities, placing greater emphasis on priority species, places, and threats, and communicating program results more clearly to the public. Recommendations to improve the overall effectiveness of Canada's conservation policies are also provided.

How can NGOs Optimize the Funding and Guidance of Environmental Youth-led Projects? (March 2024)

Author : Léa Antibi

Employer : École de la Nature de Branféré

Abstract

This report aims to answer the question: Is Génération Climat's (GC) Funding and Guidance of Environmental Youth-led Projects effective and how could it be improved? In this context, I interviewed 5 past project holders (out of the 29 funded in 2017) to gather their feedback on their projects' success and on the funding program. The interview questions explored the relationship between the accomplishment of the funding and timeline objectives, as well as the goals of each project. The main finding suggests that overall, all three project objectives, timeline, funding, and socioenvironmental, were mostly reached for all interviewed organizations. This means that GC as a funding program is efficient but can be further improved. In particular, a project's ability to meet its objectives did not seem to be directly linked to the amount of money received from the GC program in most cases. Rather, it was the capacity of the funded organization to overcome the following external difficulties: obtaining enough funding sources (other than GC), finding committed available individuals, completing the administrative work and having conflicts with natural resources exploitation lobbies. Thus, most organizations voiced that their project could have benefited from better press, guidance, and communication with the project holders. More specifically, organizations would have appreciated receiving better support, and communication with the project holder, information about a second funding opportunity, training essionns on specific skill sets, and better press about their project on the NGO's platforms. The GC program's strengths which must be preserved include its simple application process, media exposure, and credit given to projects. Altogether, being a successful funding program means supporting successful projects. To achieve this, the program should first take into account each project's needs (i.e., budget, guidance, and timeline) to determine how many it can fund in the long-term. A recommendation to funding agencies is that if their aim is to help as many projects as possible in a short time frame, they should redirect project holders towards other long term support structures.

A Qualitative Analysis of the Impact of the Quebec 1974 Environmental Quality Act on Peatland Recovery (March 2024)

Author: Karina Volpato

Employer: Premier Tech

Abstract

Peatlands provide multiple ecological services. Peat (peatland soil) is a commercially valuable resource, but it takes thousands of years to recover the amount of peat harvested. Additionally, harvested peatlands were historically left abandoned. Since harvesting peat degrades peatlands, natural peatland recovery is improbable – leading to the loss of peatlands. In 1974, Québec enacted the Environmental Quality Act (EQA). Although legally obligating peat harvesting industries (PHIs) to restore harvested peatlands, it did not set out any restoration guidelines. Consequently, the Peatland Restoration Guide (PRG) was developed to help PHIs meet their legal obligations. This paper seeks to address the following research question: how did the obligation to restore harvested sites in Quebec under the EQA impact peatland recovery? A qualitative field analysis of seven case study bogs (Bois-des-Bel, Cacouna, Verbois, Chemin-du-Lac, Jardins de Perlite, President-Ouest, and Saint-Alexandre), located within a 25 km distance from Premier Tech (PT) headquarter, was conducted to answer this question. The analysis focused on the site's vegetative conditions following the cessation of harvesting activities. The establishment of bog species, such as Sphagnum, are key indicators of recovery. The analysis considered if site abandonment or restoration, time following site abandonment or restoration, and harvesting methods had an effect on peatland recovery. Although the obligation to restore under the EQA had a significant impact on peatland recovery, the findings show that the level of recovery was dependent on factors such as time and hydrology. The study found that sites that were either improperly restored or left abandoned for a significant amount of time prior to restoration did not favour the establishment of bog vegetation whereas ones restored according to the PRG did. Harvesting methods had no impact on recovery. The analysis recommends that PHIs must not only undertake restoration efforts, but do so with careful consideration of the guidance set out by the PRG. The re-establishment of an evenly distributed hydrology and the timely restoration following the cessation of harvesting activities is key to peatland recovery.

Revitalizing Indigenous Knowledge in the Canadian Species-at-Risk Recovery Process: A Case Study of the Southern Mountain Caribou (March 2024)

Author: Manon Raby

Employer: Canadian Wildlife Service

Abstract

The biodiversity crisis is disproportionately impacting Indigenous communities due to their fundamental attachment to the environment. Nonetheless, Indigenous peoples have frequently been neglected from federal conservation efforts, such as environmental assessments and species-at-risk assessments, despite being the most effective at conserving and stewarding the environment. With the implementation of the United Nations Declaration of the Rights of Indigenous Peoples, the Government of Canada must better address Indigenous peoples' concerns in conservation policies. This report utilizes a case study of Environment and Climate Change Canada's 2014 Southern Mountain Caribou Recovery Strategy to address the following research questions: What are the shortcomings of the southern mountain caribou recovery strategy? How can addressing them help revitalize Indigenous Knowledge for future species-at-risk recovery processes? Two shortcomings of the recovery strategy were identified—a lack of meaningful Indigenous representation and incomplete critical habitat mapping. Using the auto-coding software ATLAS.ti, a gualitative and guantitative content analysis of six Indigenous caribou conservation and consultation documents was conducted to identify Indigenous perspectives on federal caribou conservation. The main findings identified opportunities for improvement, such as language revitalization initiatives to help facilitate the meaningful engagement and representation of Indigenous peoples in the recovery process. Indigenous peoples also recommended that local caribou studies and data be used to complete critical habitat mapping and provide a better depiction of caribou diversity, population structure, and historical occurrences that are not captured by Western scientific frameworks. The study concludes that the species-at-risk recovery process must promote Indigenous Knowledge Holders to decision-making roles and support Indigenous-led recovery strategies.

Understanding the Motivations of Volunteers in Oakvillegreen Conservation Association Stewardship Programs (March 2024)

Author: Benjamin Laing

Employer: Oakvillegreen Conservation Association

Abstract

This report examines the motivations driving volunteers in environmental stewardship, focusing on Oakvillegreen, an environmental organization. This research is guided by the question what primary motivators lead to volunteer participation in Oakvillegreen's stewardship programs? Analysis is accomplished through the distribution of a modified Likert Scale style survey to 271 stewardship program volunteers on what aspects are most important to them, ranked on a scale from one to four with the survey adapted from past research on volunteers' motivations. Through a comparative analysis of the results of different age group's survey results, generational differences with a predominant motivation across demographics and a deep concern for the environment. While career prospects and personal benefits were less significant motivators, learning, social connections, and value alignments emerged as strong drivers. The report underscores the centrality of environmental concerns in motivating volunteers, highlighting the importance of messaging focused on environmental impact for youth engagement. For adults, emphasizing learning opportunities and the health benefits of outdoor activities can enhance recruitment efforts. Seniors, who value environmental preservation and project organization, benefit from tailored programming that supports lifelong learning and provides clear expectations. Overall, this study contributes insights into the motivations driving environmental volunteering, emphasizing the significance of intrinsic values and the environment's central role in volunteer engagement. The findings inform targeted strategies for volunteer recruitment and retention, enhancing the effectiveness of environmental stewardship initiatives. It is recommended that Oakvillegreen continue to market programs as it currently does and expand messaging to include new areas that scored highly across other motivations, including learning opportunities and skill development at events.

Including Cumulative Effects in Infrastructure Canada's Environmental Assessment and Indigenous Consultation Processes (April 2024)

Author: Stéfanie Larose

Employer: Infrastructure Canada

Abstract

As demonstrated by the 2021 Yahey v. British Columbia decision, Canadian governments are failing to act honourably towards Indigenous groups (IGs) who have for decades voiced their concerns with continuous project approvals that disregard the accumulation of seemingly insignificant impacts to their rights. This report addresses two research questions: "How are cumulative effects (CEs) to Aboriginal and treaty rights currently accounted for in Infrastructure Canada's (INFC) environmental assessment and Indigenous Consultation (EAIC) processes?" and "How can INFC improve its EAIC processes in British Columbia to improve the protection of Aboriginal and treaty rights against CEs?" The first research question was answered by analyzing five EAIC procedural documents. The results found that by following federal guidance and having no strict standards for contextualizing projects, INFC leaves Indigenous rights vulnerable to CEs and IGs' CE concerns easily dismissible. The second research guestion was addressed through a gualitative content analysis of 16 documents. The contents were divided into three overarching categories: EA failures, alternatives to current EA practices, and obstacles to implementing proper Indigenous rights CE assessments. Overall, the results find that a shift toward a regional approach to environmental management with a strong legislative backing is necessary to support proper CEs consideration and protect Indigenous rights. Combining the results with the nature of INFC's work, the report provides ten recommendations to improve the protection of Indigenous rights. All recommendations affirm that, to act honourably, INFC should make considerable efforts to include CEs to Indigenous rights in its EAIC processes.

Indigenous Rights: The Henvey Inlet Wind Energy Centre under the First Nation Land management Regime (April 2024)

Author: Yassmine Boctor-Moghaddam

Employer: Indigenous Services Canada

Abstract

Since the introduction of The Framework Agreement on First Nation Land Management Act, recognizing reserve land management as a First Nation-led process, and UNDRIP receiving royal assent in Canada in 2021, this report asks: are Indigenous land and environmental management rights addressed and pursued in a manner that is consistent with UNDRIP by looking at the environmental assessment of Henvey Inlet's Wind Energy Centre. To inform the research question, the qualitative analysis involves employing an evaluation framework to assess the implementation of four over-arching Indigenous land and environmental rights by asking: Is the First Nation's assertion over their traditional territories and their right to self-determination and self-government respected and recognized? Are First Nations' culture, values, and identity, including the knowledge, laws, and languages, protected and respected? Is the First Nation's right to conserve and protect the environment, as well as determine and utilize the productive capacity of their lands and resources, respected and recognized? Is there a true partnership, based on Free, Prior and Informed Consent, between First Nations and its people, Crown governments, and the private sector? The results of the study suggest that the project's environmental assessment process has proven to be relatively successful in upholding the minimum standards set out in UNDRIP. This can be owed to Henvey Inlet First Nation's internal capacity and development of their EA Guidance Instrument and other land laws. Such documents provided the standards to which the proponent must achieve when conducting the assessment, engaging with Indigenous and non-Indigenous communities, and data and knowledge gathering for the analysis. Nevertheless, seven criteria were either partially or inadequately met, regarding a lack of information and clarity on mitigation measures and follow-up monitoring implementation at the discretion and in collaboration with the Nation, as well as a lack of clarity regarding certain consultation procedures and activities. This is indicative of the need for continued improvements in environmental assessment as a general practice, and specifically as it relates to projects on reserve under the Framework Agreement.

Cultivating Insights: Examining the Methods of Indigenous-Led Assessments in Canada Preceding the 2019 Impact Assessment Act (April 2024)

Author: Blanca Esteban Brown

Employer: The Firelight Group

Abstract

This paper investigates the methodologies of Indigenous-led Assessments (ILAs) in Canada as a means to understand the characteristics that define contemporary assessments. By focusing on three case studies from British Columbia (BC), Alberta, and the Northwest Territories (NWT) completed prior to 2019, this study aims to define and answer questions surrounding the distinguishing features of ILAs differentiating them from regulatory Environmental Impact Assessments (EIAs). Two analysis will be done to answer this question. Firstly, a thematic analysis will identify how ILA methods align with key thematic elements identified in existing literature. Secondly, precedentsetting elements within the ILAs methods will be identified and compared to regulatory EIA methods to determine the unique characteristics of ILAs. The findings suggest that the methods in the three assessments align with the key themes documented in the literature, however, there are variations in how these themes were incorporated. Nevertheless, these ILA methods carry significant implications for the evolution of ILAs in Canada. The three case studies are all relevant to defining contemporary best practices for ILAs, underscoring the importance for Indigenous Nations/groups to receive guidance from past experiences when developing their methods for an ILA. Additional research to uncover the state of ILAs within Canada is needed to further establish standardized best practices, which would enhance the accessibility of ILAs to Indigenous Nations/groups.

An Analysis of the Effectiveness of Substituting a Federal Environmental Assessment to a Provincial Environmental Assessment in Canada (April 2024)

Author: Cassandra Ligeti

Employer: National Capital Commission

Abstract

Cooperation between governments during Environmental Assessment (EA) processes is crucial to ensuring an efficient process for stakeholders and thorough decisionmaking. Efforts to improve this collaboration, put forth by the federal government, include different options such as harmonization of processes, delegation of portions of an EA and substitution (the ability for the federal EA process to be replaced by the provincial one). This report focuses on the use of substitution to optimize cooperation during EAs in Canada by reducing duplications and inefficiencies. Other cooperation instruments are analyzed as well to compare available tools in the Canadian EA legislation. Together, this report aims to answer the research question: Is the substitution of a federal EA for a provincial EA an effective tool for cooperation in **Canadian EA?** I used process (procedural aspects) and outcome criteria established in previous literature to evaluate two similar assessments; one substituted EA to the province of British Columbia, and another completed by the Environmental Assessment Agency of Canada (EAAC) under the Canadian Environmental Assessment Act, 2012. Findings suggest that the substituted assessment completed by the province helped reduce the overall project approval time and reduce duplications in the EA process, all while maintaining high environmental standards. Further research is recommended to examine if substitution could be used with other provinces as a way to improve the effectiveness of EAs in Canada.

Navigating the Species at Risk Act Permitting Process: An Evaluation of Guidance Material Effectiveness (April 2024)

Author: Eylem Hanabelle Şeşen

Employer: Canadian Wildlife Service

Abstract

The permitting process under the Species at Risk Act (SARA) establishes a legal framework to support species conservation efforts. However, the effectiveness of SARA permits heavily relies on the quality of applications submitted by proponents seeking approval for activities impacting Species at Risk (SAR). This research delves into investigating the efficacy and challenges of the guidance materials provided under Section 73 of SARA, specifically targeting the experiences and perspectives of SARA permit practitioners. Drawing upon insights from a permitting team responsible for implementing and enforcing SARA regulations, the study addresses the question: Are applicants provided with the necessary guidance material to submit thorough applications for an activity impacting species at risk? Through the method of a focus group involving six permitting practitioners, selected via convenience sampling based on accessibility, the study systematically assesses common information requests (IRs) sent by permit practitioners to applicants and challenges within guidance materials address these IRs. The results reveal significant deficiencies within the guidance tools such as a lack of clarity on alternatives to proposed activities, insufficient directives on conducting surveys, knowledge gaps regarding Impact Assessment (IA)/Environmental Assessment (EA) processes, unclear expectations regarding timelines, and the absence of comprehensive templates and examples. Additionally, the analysis of keyword presence and treatment within the guidance materials using the Internship-Derived Guidance Assessment Tool showcased varied levels of implementation and provision of specific recommendations for key terms such as "Alternative(s)", "Survey(s)", "IA/ EA", and "Timeline(s)/Timeframe". These shortcomings highlight the urgent need for clearer, more explicit guidance to assist proponents in navigating the permitting process effectively, particularly for activities with incidental impacts on SAR. The study concludes with recommendations for enhancing the S. 73 guidance materials, advocating for more detailed and practical guidance, and developing an improved epermitting system. In addition to identifying deficiencies, the study also explores potential strengths or pattern trends in the guidance materials, offering insights into areas where current guidance materials are effective or could serve as models for improvement.

From Trash to Gas: A Comparative Analysis of Canada's Proposed Landfill Methane Emissions Regulation (April 2024)

Author: Gabriel Clingman

Employer: Infrastructure Canada

Abstract

Methane emissions represent a significant environmental concern with serious climate implications due to their potent greenhouse effect. Among the anthropogenic sources of methane are landfills, which generate methane-rich landfill gas when organic material decomposes under anaerobic conditions. In April 2023, Environment and Climate Change Canada (ECCC) published a proposed regulatory framework that would require many landfills to model their methane content and attend to their emissions. This report analyzes the Canadian government's framework and is guided by the following question: How does ECCC's proposed regulatory framework compare to similar regulations in British Columbia, California, and Oregon? A mixed-methods approach to deductive and inductive coding is employed to qualitatively assess the regulations of the four jurisdictions and determine the rigor with which ECCC's framework may ultimately govern Canada's landfills. Seven major regulatory themes across the four regulations emerge from the analysis, and it is concluded that, for four of these themes (waste-in-place threshold; waste accepted threshold; monitoring of atmospheric methane concentration; and the spatial intervals for monitoring), ECCC's framework would establish standards that match or exceed the highest rigor of those from British Columbia, California, and Oregon. Nevertheless, there remains room for meaningful improvement. Among other recommendations, the report suggests that ECCC consider lowering its framework's waste-in-place threshold further to include more landfills. It also recommends increasing monitoring frequency and including upstream strategies of methane emissions avoidance related to organics diversion.

Canadian Commitments to Communities: Assessing the Incorporation of Free, Prior, and Informed Consent (FPIC) in Northern Canada Mine Closure Practices (April 2024)

Author: Joeli Plakholm

Employer: Environnemental Ressources Management Consulting

Abstract

Urgent attention from the Government of Canada (GoC) is required to address the historical and ongoing environmental, social, and cultural injustices disproportionately affecting Indigenous communities from abandoned legacy mine sites. Engagements with Indigenous communities during mine closure practices offer an opportunity to integrate elements of Free, Prior, and Informed Consent (FPIC) to foster collaborative, transparent, and consensual approaches to mine closure decision-making and subsequent remedial activities. This study assesses the extent to which Canada has operationalized FPIC elements in mine closure Indigenous engagements since the development of the GoC's Principles respecting the government of Canada's relationship with Indigenous peoples (the Principles). This study seeks to determine 1) whether the GoC has successfully implemented FPIC in mine closure engagements with Indigenous communities, and 2) whether there has been progress in including of Indigenous peoples and integrating FPIC concept in closure planning following Canada's commitment to FPIC in the Principles. The qualitative analysis employs an evaluation framework derived from the United Nations manual on best practices for implementing FPIC. The analysis assesses the integration of FPIC elements both before and after the implementation of the Principles for the Giant Mine Remediation Project (GMRP), with a focus on Indigenous engagement plans and strategies. The results suggest there have been improvements in the incorporation of FPIC elements for GMRP Indigenous engagements. communication, and inclusion in mine closure practices. However, most FPIC elements were found only partially met in the most recent iteration of the GMRP engagement plan. When investigating the inclusion of FPIC within the mine closure regulatory regime of the Northwest Territories, it became apparent that FPIC was not prominently featured as a primary guiding framework for Indigenous consultations. This highlights the necessity for improvements in Indigenous engagement policies, guidelines, and frameworks in mine closure practices. Enhancing the inclusion of FPIC principles in mine closure practices could extend to clarifying legal uncertainty and adherence to FPIC, establishing independent oversight mechanisms for FPIC implementation, improving capacity for Indigenous participation, supporting Indigenous governance structures, increasing Indigenous representation in decision-making, and integrating more Traditional Knowledge into mine closure practices.

Empowering Indigenous Climate Leadership (ICL) through Diesel Reduction: Clean Energy in Remote Indigenous Communities in Canada (April 2024)

Author: Claudia Voggenreiter

Employer: Natural Resources Canada

Abstract

Canada currently finds itself amidst addressing the global climate crisis by transitioning to a low-carbon economy and working towards its promises of reconciliation through the implementation of the United Nations Declaration on the Rights of Indigenous Peoples (UN Declaration), and the Truth and Reconciliation Commission of Canada (TRC) Calls to Action. In efforts to address climate changes and reconcile Indigenous-settler relationships, significant emphasis has been placed on promoting the transition towards clean energy. Remote Indigenous communities, who rely primarily on diesel-fuel generators, are now exploring the potential opportunities to transition to clean energy to fulfill their energy needs. The study aims to explore how success in diesel reduction is assessed in clean energy projects in remote Indigenous communities in Canada. Using the Three Nations Energy (3NE) Solar Farm Project in Fort Chipewyan as the case study to be analyzed, the following research question will be addressed in this study: How does success in diesel reduction differ between the Two-Eyed Seeing approach in the 3NE Solar Farm Project? Two-Eyed Seeing brings together the strengths of Indigenous ways of knowing and the strengths of Western ways of knowing for the benefit of all. From a Two-Eyed Seeing approach, the project's success in diesel reduction is assessed qualitatively from a Diesel and Emissions Saved and Indigenous Climate Leadership (ICL) perspective. Overall, the case study results are as expected and inherently positive. The Diesel and Emissions Saved perspective highlights the project's success in reducing diesel dependence, the number of diesel trucks entering the community, GHG emissions, and the associated cost savings of these actions. The Indigenous Climate Leadership (ICL) perspective highlights the project's success in strengthening energy security and sovereignty, Indigenous self-determination, capacitybuilding and ownership, and community well-being in Fort Chipewyan. Following the analysis, recommendations for enhancing policy and supporting Indigenous peoples in the transition to clean energy are explored.

To Eat or not to Eat? Mitigating Elevated Risk Perceptions of Contaminants in Traditional Foods (April 2024)

Author: Claudia Schiocchet

Employer: Health Canada

Abstract

Project developments often result in the release of environmental contaminants, endangering the health of Indigenous populations and jeopardising their traditional food sources. This peril triggers heightened perceptions of risk concerning the safety of their traditional foods, with profound consequences for their physical, social, cultural, and spiritual well-being. This report addresses Indigenous health within the framework of Environmental Assessment (EA) processes and the necessity of mitigating risk perceptions, given their far-reaching implications for the well-being of Indigenous communities. The key research questions guiding this report are: "How effectively have projects assessed under CEAA2012 addressed concerns related to perceived risks of traditional food contamination?" and "What are the key factors in EAs that facilitate successful mitigation of elevated levels of perceived risk of traditional food contamination?". A comparative and critical analysis of three mining project case studies in Quebec, using a scoring matrix grounded in expert-informed criteria, reveals that when Indigenous communities are actively involved in the EA process through consultation and decision-making roles, and when there are welldefined follow-up, monitoring, and communication programs in place, there is a significant improvement in risk perception mitigation. Specifically, projects that incorporated Traditional Knowledge (TK) and community input demonstrated more effective and culturally adapted risk management strategies. This research highlights the broader importance of environmental justice and Indigenous rights, offering insights into the challenges faced by Indigenous communities within Canadian EA processes.

Indigenous Nations Concerns in Two Liquefied Natural Gas (LNG) Projects in British Columbia (April 2024)

Author: Niloofar Tavakoly Nabavy

Employer: British Columbia Environmental Assessment Office

Abstract

This report explores the engagement of Indigenous communities in the Environmental Assessment (EA) process for two major liquefied natural gas (LNG) projects in British Columbia, Canada: The Tilbury Phase 2 LNG Expansion Project and the Ksi Lisims LNG Project. This research aims to answer two questions. Firstly, "What are the themes of concern expressed by PINs, who are conducting an ILIA, in LNG projects within British Columbia?" And secondly, "Is there a correlation between the theme of the concern expressed by PINs in LNG projects and the nations' level of education and employment rate as shown in the Canadian Census data?". The research squarely identifies themes of concern expressed by Participating Indigenous Nations (PINs) during a specific phase of the EA by using a qualitative approach providing insights into their perspectives on project impacts. A Spearman correlation analysis is conducted using Canadian Census data to understand the relationship between the themes of concern and demographic characteristics of Indigenous nations involved. Overall, nine main themes were identified, and the findings suggest that Indigenous communities' concerns in EA processes encompass a range of issues, including environmental effects, community well-being, Indigenous consultation and engagement, and socioeconomics. The study also reveals the complex relationship between these concerns and demographic characteristics, highlighting the nuanced interplay between Indigenous communities' socio-economic status and their engagement in environmental decision-making processes.

Identifying Funding and Process Gaps in Impact Assessment Participation in Canada's North (April 2024)

Author: Erin Smith

Employer: Parks Canada

Abstract

The goal of this study was to evaluate the assessment of road mortality environmental assessment certificate (EAC) applications in British Columbia, addressing the research question: What is the quality of road mortality assessment in British Columbia EAC applications? Nine projects were selected, eight from the provincial registry and one from the federal registry. Based on the MEnv internship report of Meek-Sauriol in 2022, seven evaluation criteria were used to evaluate the road mortality assessments for herpetofauna, birds, small mammals, large mammals, and special-status species. Scores were assigned upon reading through the documents submitted for the EAC applications, and lower scores suggest low performance in an evaluation category while high scores suggest high performance. The lowest scores were found for birds, with an average of 21.1%. The highest scores were found for special status, with an average of 45.6%. Among the projects, most mitigation measures used were recommended by the British Columbia Ministry of Transportation and Infrastructure, like warning signage and speed limits, despite inconclusive evidence of their efficacy in scientific literature. Additionally, proponents frequently cited the Wildlife Accident Reporting System (WARS) available in British Columbia. These data give information on the location and the species involved in wildlife-vehicle collisions of large mammals but are not dependable for smaller species or for providing temporal data. Moving forward, proponents should complement the WARS data with more detailed studies. This would also permit them to select and apply more appropriate mitigation measures.

Shifting towards Non Lethal Pollinator Surveys in the Field of Conservation (May 2024)

Author: Michelle Faerstein

Employer: WWF-Canada

Abstract

There is great concern for declining pollinator populations. Restoring and conserving their habitats is necessary to reverse and prevent decline. To understand the successes and challenges of restoration and conservation efforts, monitoring using insect surveys is required. Current insect survey standards typically employ lethal capture methods. Lethal surveys involve ethical issues and some may feel they contradict the idea of animal conservation. As such, I and others in conservation desire shifting towards non-lethal alternatives. This report addresses the research question: are non-lethal insect surveys a valid and feasible alternative to lethal insect surveys in the conservation field? To answer this, a case study of a lethal netting protocol and a non-lethal iNaturalist-based protocol is presented and the differences in validity and feasibility analyzed through calculating mean species abundance, richness, Shannon Diversity Index, and a list of equipment required. A discussion on a literature review of ethical ramifications is presented, covering insect sentience, moral issues of death and animal welfare, bycatch and dangers to endangered species. Overall, this report finds the non-lethal protocol is a valid and feasible alternative to the lethal protocol. It also finds the non-lethal protocol is more effective at observing smaller bees, potentially because their size, speed and flight height increases netting difficulty. This report makes several recommendations: shift towards nonlethal, non-invasive insect surveys in conservation; standardize a non-lethal protocol to ensure similar quality and efficacy across activities; continue improving surveys; and further research on comparisons between lethal and non-lethal protocols with stricter testing conditions.

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Enhancing Canadian Regional Assessment Frameworks: Key takeaways from the Regional Assessment of Offshore Oil and Gas Exploratory Drilling East of Newfoundland and Labrador (May 2024)

Author: Ulrik Ladouceur

Employer: Impact Assessment Agency of Canada

Abstract

This study focuses on the effectiveness of the Regional Assessment (RA) of Newfoundland and Labrador for offshore oil and gas exploratory drilling (NLRA), the first RA implementation under Canada's Impact Assessment Act of 2019. The research question for this report is How can Canadian RA frameworks be improved to optimize environmental protection, and report usefulness for all stakeholders? Using a set of criteria based on the Gunn & Noble's basic RA principles, the case study reveals that the NLRA moderately succeeded in aspects such as being future-oriented, commencing early, being multi-tiered, adaptable, and effectively disseminating its findings to governments, industry, the public, and Indigenous communities and organisations. However, the analysis identified significant shortcomings in the RA's capacity to be strategic in nature, to focus on cumulative effects and on regional valued components, to have an inclusive participatory process, and to integrate sustainability considerations. The constrained timeline for the RA's delivery emerged as a critical limitation, preventing comprehensive data gathering and meaningful community involvement. Recommendations for improving future RAs in Canada include extending assessment timelines for a thorough analysis and engagement, enhancing environmental data baselines, and to consider long-term sustainability and cross-boundary impacts. This case study represents a unique learning opportunity for refining RA frameworks in Canada towards a more sustainable and participatory impact assessment process. As Canada progresses with this new assessment tool, the insights gained from the NLRA are invaluable in ensuring that future RAs effectively balance environmental integrity with socio-economic growth, contributing to a sustainable legacy for future generations.

An Evaluation of Wildlife Road-Mortality Assessment Quality in Alberta EAs (May 2024)

Author: Julia Gregory

Employer: Crown-Indigenous Relations and Northern Affairs Canada

Abstract

The impacts of roads on wildlife have been poorly considered in linear infrastructure planning. even while research shows significant declines in wildlife populations resulting from roadmortality. Given the rapid increase in road developments globally, better planning is critical to reducing the negative impacts of roads and preserving biodiversity. Environmental assessment (EA), a decision-making process to identify and mitigate potential adverse environmental impacts of projects, can help plan wildlife-friendly roads. However, informed decisions require quality information. To help improve biodiversity considerations in EA-in line with new federal commitments-this research examines the quality of wildlife road-mortality assessment in environmental assessments in Alberta. It is part of a broader study assessing EAs from other Canadian provinces. Based on a study of Quebec EAs by Meek-Sauriol (2022), this study assessed the quality of road-mortality considerations in eight environmental assessments of roads in Alberta. Criteria defining 'quality' represented information necessary for decisionmaking, including species-specific risk identification, spatial and temporal data collection, population impacts, and mitigation measures. Results showed that while assessment quality was low overall, it was highest for protected species and for large mammals, and lowest for small mammals. Conservation status may influence assessment quality more for birds and herpetofauna than for mammals. Findings suggest the potential for well-developed provincial road-mortality data management programs and other regional biodiversity monitoring tools in strengthening road mortality assessment in EAs.

Vegetation Monitoring at Oil Spill Incidents: A Proposed Protocol to Measure Environmental Recovery Success (May 2024)

Author: Claire Cazorla

Employer: National Environnemental Emergencies Center

Abstract

The aftermath of an oil spill presents a multifaceted challenge to ecosystems, particularly concerning the restoration of impacted environments. Vegetation, a fundamental component of terrestrial and aquatic ecosystems, plays a pivotal role in the recovery phase of oil spills. By developing a comprehensive vegetation sampling protocol, environmental scientists can accurately assess the extent of ecological damage, monitor the progress of recovery efforts, and inform targeted restoration strategies. This report outlines the development of a vegetation sampling protocol for assessing post-oil spill environmental recovery. The protocol was completed using a case study to analyze vegetation sampling literature to address the following research question: "What is a functional vegetation sampling protocol to assess the recovery of freshwater vegetation following an oil spill?" In response, a research analysis of scientific literature was completed, investigating best practices in ecological sampling and field-testing methodologies domestically and internationally using Qualitative Comparative Analysis (QCA). The results of this analysis identified seven sampling criteria deemed essential to measure environmental recovery success: vegetation health, plant cover percentage, vegetation stress, vegetation species richness, species biodiversity, toxicity testing, and identification of vegetation exposure level to oil. These criteria were determined by comparing their utilisation and analysing their occurrences in Canadian and international protocol literature. The findings of this report were successfully incorporated to create a vegetation sampling protocol and the use of this protocol is recommended to guide decision-makers in assessing the recovery of vegetation following oil spills across Canada.
An Evaluation of Road-mortality Assessment in Road Project Environmental Assessments in Ontario (June 2024)

Author: Vimal Kothari

Employer: Impact Assessment Agency of Canada

Abstract

The goal of this study was to evaluate the quality of road mortality assessment of road project environmental assessments (EA) in Ontario. Eight projects were selected, seven of which were assessed provincially, under Ontario's Environmental Assessment Act, and one, federally, under the Canadian Environmental Assessment Act, 1992. A total of seven evaluation criteria, taken from the MEnv. report of Meek-Sauriol, were used across five species groups - herpetofauna, birds, small and large mammals, and special-status species, to answer: what is the quality of road mortality assessment in Ontario EAs? Scores were given to each project by evaluating the latest, relevant documents available. The overall quality of road mortality assessment was very poor, with the average final relative score being 10.7%. Large mammals scored highest (17.1%), followed by herpetofauna (12.1%), small mammals (10%), special-status species (8.3%), and in last, birds (6.7%). The average relative final score across the different evaluation criteria varied, with the list of potentially affected species scoring highest (29%) and follow-up and monitoring scoring lowest (0%). Mitigation measures proposed were generalised, not species-specific, and not adequate. This study identified four major gaps in the provincial legislation. They were: 1) sectoral regulation exemptions, 2) lack of oversight on follow-up and monitoring compliance, 3) lack of public involvement in streamlined EAs, and 4) lack of cumulative effects assessments. Ontario's environmental legislation desperately needs a reform as it is nearly 50 years old. The results from this study were similar to those in Meek-Sauriol's MEnv. report for Quebec but worse than those of Smith's report for B.C.

Lessons from Nunavut and British Columbia on Federal Impact Assessment Conditions: Health, Social and Economic Impacts on Indigenous Peoples (June 2024)

Author: Trevor Rollins

Employer: Impact Assessment Agency of Canada

Abstract

Projects developed near Indigenous communities have the potential to result in grave impacts to those communities. The Impact Assessment Act was passed in 2019 with the goal of allowing conditions in decision statements that can mitigate adverse or enhance positive effects on their health, social and economic well-being. The Cedar Liquid Natural Gas (LNG) decision statement is the first and only to be published under the Impact Assessment Act. Project certificates from the environmental assessment regimes of Nunavut and British Columbia are roughly equivalent to federal decision statements, and can be used to evaluate the extent of the inclusion of these types of conditions in the Cedar LNG decision statement. The case study presented in this report performs a comparative analysis of project certificates and the decision statement to answer the research question: Does the Cedar LNG decision statement contain conditions that utilize the full extent of the health, social and economic provisions of the Impact Assessment Act? The results show that the Cedar LNG decision statement was moderately successful in producing conditions that mitigate or enhance health, social and economic effects to Indigenous people. Conditions from the project certificates can provide examples for the Impact Assessment Agency of Canada when developing future decision statements. British Columbia proves to be a more useful source of conditions for the Impact Assessment Agency of Canada, especially in regard to social conditions (e.g. affordable housing options for employees) and economic conditions (e.g. supporting workers in the event of premature project closure).

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Identifying Funding and Process Gaps in Impact Assessment Participation in Canada's North (January 2023)

Author: Nicholas Pfeiffer-Major

Employer: Crown Indigenous Relations & Northern Affairs Canada

Abstract

This report sets out to identify the shortcomings of impact assessment participation funding in Northern Canada by answering the question "What funding and process gaps exist in Northern Canada that affect Indigenous communities' ability to meaningfully participate in impact assessments?" The Northern Participant Funding Program (NPFP) is the primary federal grants and contributions program responsible for funding Indigenous communities in meaningful engagement in the assessment of proposed major resource development projects affecting their traditional territory. The program was created in 2018 with a budget of \$10.3 million over five years. During the winter of 2022, the NPFP held a series of twelve virtual engagement sessions to identify what participants believed was working well within the program and what could be improved upon. Transcripts were created during these sessions and a thematic analysis of an interview was performed with colour coding in order to identify the topics that were of most interest to the participants. Both a quantitative and qualitative analysis of the data were performed. The three most frequently mentioned themes were 1) participant or project eligibility, 2) funding timelines, and 3) gender based analysis plus (GBA+), which resulted in a total of 43, 30, and 27 discussions respectively across all engagement sessions. While many helpful suggestions were raised during the engagement sessions, it was determined that addressing many of them requires an increase in overall budget of the program, as well as, increased capacity within Indigenous communities and within the NPFP itself.

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An Icon in Peril Investigating the Institutional Barriers to Canada's National Recovery Strategy for Boreal Caribou under the Species at Risk Act (February 2023)

Author: Matthew Hawco

Employer: Office of the Auditor General

Abstract

Boreal caribou populations across Canada have continued to decline despite the ecotype being listed as threatened under the Species at Risk Act (SARA) in 2002 and the release of its National Recovery Strategy in 2012. Undermining its recovery is a chronic pattern of delays and noncompliance with SARA-mandated recovery measures and critical habitat protection by the federal government and its subnational partners. This report is guided by two questions: "What are the root causes underpinning the federal government's chronic noncompliance with SARAmandated timelines?" and "What are the barriers to the effective protection of boreal caribou critical habitat?" This report investigates the trajectory of boreal caribou recovery over the last twenty years while also exploring the institutional and practical challenges in conserving Canada's biodiversity under SARA. Research was primarily conducted through the collection and review of articles and documents pertaining to boreal caribou recovery and the National Recovery Strategy, legal interpretations and parliamentary reviews of SARA, federal court decisions, performance audits, and governmental and non-governmental reports. The results suggest that many difficulties affecting recovery programs can be traced to the beleaguered implementation of SARA caused by long-term capacity deficiencies and uncertainty over the interpretation of legislated responsibilities like critical habitat identification. Meanwhile, the primary barrier to the effective protection of boreal caribou critical habitat persists in subnational noncompliance and the federal government's proclivity to maintain friendly interjurisdictional relations over enforcing SARA's mandate through discretionary protection powers.

National Parks and Ecological Connectivity: A Tiered Approach (March 2023)

Author: Meghan Butt

Employer: Parks Canada

Abstract

Ecological connectivity has come to the forefront of conservation measures as it is widely recognized that protected areas such as national parks are not sufficient in protecting biodiversity on their own. Additionally, ecological connectivity networks or corridors are required to ensure the effective conservation of biodiversity. In Canada, Parks Canada is one of the authorities responsible for implementing connectivity on a larger landscape scale, crossing park boundaries, in order to meet their conservation objectives. Parks Canada has a tiered management approach to ecological connectivity, however numerous approaches exist to manage ecological connectivity, which lead the International Union for Conservation of Nature (IUCN) to release their guidelines for connectivity conservation, which are internationally recognized and recommended by the Convention on Migratory Species. The IUCN guidelines serve as a standardized approach for protected areas to use to effectively attain ecological connectivity. The research question guiding this study is: to what extent is Parks Canada's tiered management approach to ecological connectivity meeting the IUCN guidelines? The IUCN guideline principles were used as a framework to analyze Parks Canada's tiered management approach which was demonstrated through the examination of three national parks; Banff, Mount Revelstoke & Glacier, and Forillon National Parks. The analysis revealed that overall, Parks Canada's tiered management approach to ecological connectivity is effectively meeting the IUCN guidelines with minimal gaps and may serve as an exemplary management approach that can be adopted by other organizations or agencies that are also trying to establish ecological connectivity on larger landscape scales while meeting the IUCN guideline principles.

Improving Critical Habitat Protection on Non-Federal Lands: An Efficacy Evaluation of Policy-Oriented Steps in Species at Risk Progress Reports (April 2023)

Author: Josiah Becker

Employer: Canadian Wildlife Service

Abstract

Ecological connectivity has come to the forefront of conservation measures as it is widely recognized that protected areas such as national parks are not sufficient in protecting biodiversity on their own. Additionally, ecological connectivity networks or corridors are required to ensure the effective conservation of biodiversity. In Canada, Parks Canada is one of the authorities responsible for implementing connectivity on a larger landscape scale, crossing park boundaries, in order to meet their conservation objectives. Parks Canada has a tiered management approach to ecological connectivity, however numerous approaches exist to manage ecological connectivity, which lead the International Union for Conservation of Nature (IUCN) to release their guidelines for connectivity conservation, which are internationally recognized and recommended by the Convention on Migratory Species. The IUCN guidelines serve as a standardized approach for protected areas to use to effectively attain ecological connectivity. The research question guiding this study is: to what extent is Parks Canada's tiered management approach to ecological connectivity meeting the IUCN guidelines? The IUCN guideline principles were used as a framework to analyze Parks Canada's tiered management approach which was demonstrated through the examination of three national parks; Banff, Mount Revelstoke & Glacier, and Forillon National Parks. The analysis revealed that overall, Parks Canada's tiered management approach to ecological connectivity is effectively meeting the IUCN guidelines with minimal gaps and may serve as an exemplary management approach that can be adopted by other organizations or agencies that are also trying to establish ecological connectivity on larger landscape scales while meeting the IUCN guideline principles.

Comparison of Canadian and European Sustainable Finance Legislation (April 2023)

Author: Simon Lizotte

Employer: Oxia Initiative

Abstract

Limiting global warming to under 2 °C will cost an estimated \$50 trillion USD in sustainable finance investments by 2050, which will require government and the private sector support. However, numerous criticisms have been made of sustainable finance, particularly concerning greenwashing. To compare how the EU and Canada address sustainable finance through legislation, this study rated a set of relevant documents based on a list of 23 questions and three overarching themes: Transparency and Expertise, Standardization, and Enforcement. While the European Union focuses on standardizing terminology and disclosures for investor transparency, Canada prioritizes industry innovation and recommendations, rather than enforcement. Looser standards could incentivize capital to come to Canada, while SFAP could prevent Canadian companies from expanding to Europe due to regulatory burden. This may have led to increasing the growth potential of the sustainable finance sector in Canada by making it easier for companies to define themselves as sustainable. Despite the higher potential for growth, the Canadian government needs to begin taking actions to regulate and oversee sustainable finance. There are two aspects of the SFAP Canadian legislation needs to study and implement: the development of a materiality criteria and a standardized taxonomy for sustainable activities. Ultimately, while it is important for the government to set legislation to hold public and private companies to higher standards, governments also need to be incentivized, through public pressure and international standardization, to act in the best interest of long-term and sustainable activities.

Environmental and Social Performance in North American Mining Companies and the Link to Financial Returns (April 2023)

Author: Elisabeth Lekhtman

Employer: Global Alpha Capital Management

Abstract

Responsible investing has become a very prominent topic in the last few years as climate change and social justice become more widely addressed issues. With climate change worsening, investments are pouring into sectors supporting the energy transition. The mining sector will be a critical piece of the energy transition as it provides important inputs into many of the arising technologies. Thus, assessing a mining company's environmental and social impact becomes paramount, as supporting violators of environmental regulations or human rights actions would have a negative real-world impact. ESG investing is still debated, but firms with better ESG performance are said to be more efficient and experience financial benefits in the long term. The report presents a case study of three North American gold mining companies, Newmont, Barrick Gold and Agnico Eagle Mines and aims to answer the primary research question which is: How does a mining company's environmental and social performance influence its stock price? The case study uses environmental and social indicators and compares them to the respective stock prices to determine whether environmental and social performance have an effect on the company's financial performance with the help of regression analysis. The study found that ESG factors do impact companies' stock prices to a certain extent, with the strongest relationship seen in Newmont. The report concludes that considering environmental and social factors is important in evaluating a company's financial performance, and that stakeholders' perceptions depend on companies' progress towards their sustainability goals.

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Using Alternative Roost Structures to Mitigate Impacts to Townsend's Big-Eared Bat (Corynorhinus townsendii): A Case Study of the Management of a Maternity Colony in Qualicum Beach, B.C. (September 2023)

Author: Siobhan Rae Knowles

Employer: Primatology and Interdisciplinary Environmental Studies Lab, Concordia University

Abstract

Bats in North America are facing many threats by human activities. These threats, many of which are regulated under the Impact Assessment Act, 2019, have already caused significant impacts to several bat species. Impact mitigation measures, such as the construction of alternative habitat structures, are a key component of the impact assessment process. The use of new alternative roosting structures to mitigate human-caused impacts to Townsend's bigeared bat (Corynorhinus townsendii) colonies may be a promising tool. This paper examines the following research question: is the use of alternative roost structures a viable impact mitigation tool for Townsend's big-eared bat? This is accomplished through a case study of the management of a maternity colony in Qualicum Beach, British Columbia. The relationships between behaviours observed from video monitoring data and external environmental variables collected during the first year of acclimatization of the maternity colony to a new roost structure were examined. The findings suggest that the number of bats observed in the video recordings had the strongest influence on the variation in the number of types of behaviours occurring in the new roost structure. Week had a moderate influence and time of day and roost temperature had minimal influence on the variation in the number of types of behaviour occurring. Alternative roost structures can be a viable short-term impact mitigation tool; however, continued monitoring of new roost structures is key to determine long-term viability.

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Legal Personhood Rights for the Mutehekau Shipu/Magpie River: Rights of Nature approaches and policy tools for a path forward in so-called "Canada" (September 2023)

Author: Emily Roslyn Hoppe

Employer: Crown Indigenous Relations and Northern Affairs Canada, Environmental Assessment, Land Use Planning and Conservation Division

Abstract

The Rights of Nature (RoN) movement emerged in response to shortcomings in current environmental law and regulatory systems. It challenges these dominant systems by shifting conceptions of ownership and rights. Legal personhood approaches have only emerged in socalled "Canada" in recent years. In February of 2021, the Mutehekau Shipu/Magpie River in Québec became the first river in Canada to receive legal personhood. This study therefore aims to address existing gaps in literature and inform future RoN initiatives across the country by addressing two primary research questions: (1) What factors were present in creating successful RoN frameworks for the Mutehekau Shipu/Magpie River in so-called "Canada"? and (2) What is the sociocultural significance of RoN according to members who have helped to undertake such an approach? Virtual interviews were conducted with members of the "Mutehekau-shipu Alliance" and qualitatively analyzed to identify eleven factors that played a role in establishing successful RoN frameworks for the Mutehekau Shipu/Magpie River: Regional Consensus; Indigenous and Youth Leadership; Municipal Political Will; Ecological Threats and Previous Industrial Development; Research and Academia; Eco-Tourism, Stewardship, and Alternative Economic Opportunities; Recognition and Publicity; the Global Rights of Nature Movement; Innovative Legal Support, Mechanisms, and Strategies; Funding; and Provincial Legislation. It is concluded that the sociocultural significance of environmental

personhood lies in its ability to build relationships, foster consensus, and champion Indigenous stewardship, and that this approach represents transitionary steps towards transformative and reconciliatory cultural change in the Canadian context.

Canada's Failure to Fulfill its Promise on Capacity Support for Indigenous Peoples in EIA (September 2023)

Author: Theresa Blanche Comeau

Employer: Infrastructure Canada

Abstract

Limited capacity for project review, tight timelines, and a lack of trust in environmental impact assessment (EIA) and in the government are some common challenges that are inhibiting Indigenous Peoples' participation in EIA. This report examines three designated projects, under the Canadian Environmental Assessment Act (CEAA 2012) in British Columbia; Roberts Bank Terminal 2 Project, Kitimat Clean Refinery Project, and Pacific Future Energy Refinery Project. The goal of analyzing these projects is to identify how are capacity issues, tight timelines, and distrust impacting Indigenous Peoples' ability to participate in EIA? The findings highlight that capacity funding is needed early on in the Aboriginal consultation process and should cover the full cost of consultation. Next, participation timelines need to be less strict for Indigenous communities and need to take into consideration capacity issues and conflicting priorities that these communities may have. Finally, to help build trust in the government and in the EIA review process, the approach of establishing scope of impact needs to be transparent, consistent and most importantly, informed by Indigenous knowledge. These challenges have a direct impact on Indigenous Peoples' ability to participate in Aboriginal consultation with the government, on proposed projects, that could potentially have an adverse impact on the environment, and consequently infringing upon section 35 Aboriginal and/or Treaty rights. Recent changes under the Impact Assessment Act (IAA) to guidance and programs that help build capacity support for Indigenous Peoples in EIA does show promise to correct the shortfalls of CEAA 2012. In addition, the federal 2023 Budget plans to allocate funds to capacity funding to support Indigenous participation in Aboriginal consultation.

Development of a Competence-based Method for Professionals in Wildlife Monitoring Programs (November 2023)

Author: Junze Raymond Hao Employer: Canada Wildlife Services (ECCC)

Abstract

In 2020, the Canadian Wildlife Service (CWS) launched an ambitious project known as the Ecological Monitoring Framework (EMF) with the goal of measuring biodiversity, site integrity, and potential threats to migratory birds and endangered species in Environment and Climate Change Canada's (ECCC) managed protected areas. During the initial stages of the program, lack of monitoring expertise and critically understaffed with core regional responsibilities were identified as limiting factors for further development and implementation. To rise to these challenges, EMF launched the capacity mapping exercise, drawing inspiration from the comprehensive International Union for Conservation of Nature (IUCN) global competences register for protected areas practitioners. The core of this strategy was an innovative online selfassessment tool, empowering employees to evaluate their skill sets and find essential training courses to succeed in EMF. This report will examine the following research question: How does the capacity mapping exercise contribute to EMF? This report meticulously examines LIFE e-Natura2000.edu, Europe's benchmark for capacity building, comparing its structure and strategies with EMF to garner valuable perspectives and actionable advice. Self-assessment and subsequent training courses require immediate and convenient delivery methods. This report will introduce the concept of blended learning, which means a combination of face-to-face and online learning. Based on blended learning, the report advocates for the inclusion of contemporary educational tools such as interactive webinars, engaging e-platforms, and informative videos into EMF's training curriculum. As the program moves forward, regular

feedback loops based on insights from EMF participants will be the linchpin ensuring the initiative's success.

Walking Through Worlds of Indigenous and Western Practice: Evaluating Indigenous Engagement in the 2019 Impact Assessment Process (December 2023)

Author: Fiona Wilson

Employer: Indigenous Services Canada

Abstract

Indigenous engagement is a pivotal step in environmental planning and decision-making processes. It has reinvigorated dialogue since it became a new provision to the amended Impact Assessment Act 2019 (IAA 2019). This paper investigates to what extent proponents of newly proposed projects under the Impact Assessment Act 2019, referred as the New Act (IAA 2019) going forward, have achieved Indigenous engagement, and whether the New Act fulfills Indigenous engagement as a meaningful process. A part of this research explores Indigenous perspectives and testimonies in engagements related to resource development and studies three case study projects that are under the New Act. The research question therefore explored "To what degree has meaningful Indigenous engagement been achieved in the current federal IA process, and with proponents?" To support the analysis, Indigenous and non-Indigenous literature were used to evaluate Indigenous engagement. The New Act has improved its vision to include Indigenous Peoples, but its amendments have yet to be fully practiced. More space needs to be made for Indigenous Peoples that would help improve the New Act's process and their relationship with governments and proponents. Indigenous spaces involve prioritizing Indigenous voices to be heard. Based on the findings in this research there is a lack of presence from Indigenous communities in the engagement process and in projects under the New Act. Hearing the voices from community members, including women, men, youth, Elders, two-spirit, and LGBTQ can help guide and bring uniqueness and value to the impact assessment process.

More voice is often alluded towards Indigenous leaders and chiefs. Through support of the literature in this report, a meaningful Indigenous engagement process involves a diversity of Indigenous Peoples to the greatest extent possible.

Organic Workforce Challenges and Opportunities: Advancing Agri-Environmental Practices in Ontario (December 2023)

Author: Briana Vanular Employer: Organic Council of Ontario

Abstract

Through its regulation of agri-environmental practices, organic agriculture can help mitigate the impacts of climate change and contribute to sustainable food systems. High market demand presents unique opportunities to expand Ontario's organic sector and fulfill this potential. However, organic farmers cannot meet market demand largely due to workforce challenges that disproportionately impact the organic sector. Thus, this report aims to offer insight on supporting sustainable agricultural development through Ontario's organic workforce development by addressing the following research question: How can the labour needs of Ontario's organic farming sector be better supported? In response, the Grounded theory method is used to qualitatively analyze two Ontario-based surveys, five interviews, and one focus group with organic farmers and workers, and members of the organic agriculture community. Primary findings suggest that the following supports are needed: 1) Training and Education: organizational support, 2) Recruitment and Retention: workforce management, financing a workforce, and the advertisement of on-farm organic agricultural careers, 3) Workforce Fairness: stronger workforce protections. It is concluded that to better support the workforce development of the organic agriculture sector in Ontario, the following suggestions should be considered: 1) Develop a formal accredited farmer-led organic training program, 2) Adjust funding streams to focus on workforce retention, 3) Increase awareness about careers in the organic sector, 4) Investigate extending workforce protections to all agricultural workers in Ontario, 5) Address communication barriers for existing foreign-workforce programs, and 6) Consider how fairness for organic workers may be improved and recognized.

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Traditional Knowledge in Environmental Impact Assessment: A comparative study of Canada's northern processes (December 2023)

Author: Jaimee Palmer

Employer: Crown-Indigenous Relations and Northern Affairs Canada

Abstract

The year 2003 marked two decades of northern governance transformation, with authority being systematically devolved from the federal to territorial governments. With this came changes to Impact Assessment (IA) legislation within these regions, leaving questions surrounding the extent to which Indigenous traditional knowledge (TK) guides the new northern IA processes. This report examines the topic of TK inclusion by answering two research questions: 1) To what extent does TK guide and influence northern IAs, including final decisions? and 2) What are the strengths and weaknesses of each of three northern IA processes regarding consideration of TK? Data for this study were collected from online public IA registries; documents were analysed and graded according to 25 review questions, and grades were compared. Results showed that the Yukon project (Coffee Gold Mine) performed most strongly in terms of TK consideration, followed by the Nunavut project (Mary River Phase 2) and lastly that from the Northwest Territories (the Diavik Depositing Processed Kimberlite project). This was largely due to Yukon's unique pre-submission engagement requirement and how it encouraged proponents to be proactive in seeking Indigenous involvement. Overall, all three projects performed well in terms of meaningful consideration of TK. However certain weaknesses persisted, including a lack of transparency that fostered mistrust between parties. Consequently, this report makes 11 recommendations to strengthen TK consideration in future IAs, including a legislated requirement for proponents to seek free, prior and informed consent from impacted

communities, greater inclusion of TK in baseline studies and monitoring, and aligning IA processes with current best-practice principles.

Mining, Scoping, Regulations, and Fish: An examination of necessary information for impact assessment decision making (December 2023)

Author: Rebecca Clark

Employer: Impact Assessment Agency of Canada

Abstract

Mineral resources are important to society, but the environmental impacts of mining, especially on local water sources and fish populations, can be significant. The regulatory review process can improve outcomes by applying good scoping practices early in an assessment. Scoping, or deciding which information to include in an assessment, can increase efficiency and effectiveness. Guidance is especially wanted at a time when Canadian federal assessment practitioners are adjusting to the new Impact Assessment Act in the face of economic pressures to streamline processes. This report seeks to understand what documents from past assessments can tell EIA practitioners about information important to decision makers regarding fish and fish-bearing waters. It examines documents from four mining projects approved under CEAA 2012 between 2015 and 2022 to understand the concerns of and knowledge requirements for key mitigation measures recommended by assessment practitioners and legally binding conditions set by federal authorities. Results suggest that decision makers are concerned with protecting water quality, monitoring to evaluate EIA predictions and ensure ongoing compliance, and applying Fisheries Act regulations, notably by avoiding or mitigating direct harm to fish and habitat offsetting. Results also suggest possible areas for reducing information requirements in EIAs, such as focusing on fish habitat and species of interest to communities. Standardizing requirements between federal agencies and departments involved in permitting is another opportunity for improving assessment efficiency without compromising effectiveness.

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An Evaluation of the Canadian Federal Program for Voluntary Greenhouse Gas Reduction Projects in the Agricultural Sector (January 2022)

Author: Jessica Di Bartolomeo

Employer: Logiag Inc.

Abstract

The agricultural sector is historically responsible for 10% of the Canadian Greenhouse Gas (GHG) inventory and offers nature-based solutions to removing and storing atmospheric carbon in cropland. New voluntary climate mitigation incentives in Canada that price carbon and compensate reductions rely on quantifying GHG emissions. Farmland managers have various GHG accounting options to monitor and report emissions and removal performance. These include inventories that list GHG fluxes within a year at the farm scale and projects that estimate future improvements for new practices to receive compensation on the offset market. In this report, I ask (1) How do the requirements for the federal government's pricing program to encourage voluntary GHG reduction projects compare to annual GHG inventory best practices in the agricultural sector? and (2) How does annual inventory methodology align with reduction project requirements within the upcoming federal program? I perform a comparative analysis of the international inventory standard GHG Protocol - Agricultural Guidance and the Canadian Greenhouse Gas Offset System Regulations according to five categories: boundaries, calculating over time, calculating fluxes, stocks, and reporting. The comparative analysis reveals that a project must have narrower boundaries, account for owned improvements over time, predict fluxes for long-term storage, mitigate risks of large stock reversals, and submit frequent, verified reports. I present eleven recommendations for land managers who aim to align their inventory disclosures with future reduction projects. These suggest ways to institutionalize data collection practices, identify risks and opportunities for reduction projects for high-performing farms, and streamline calculation and reporting requirements.

Treading the Murky Depths of Environmental Injustice: An Investigation of Toxic Contamination in Kanesatake (January 2022)

Author: Nikita Bhat

Employer: TerraHumana Solutions

Abstract

The prevalence of toxic contamination on Indigenous lands is a ubiguitous phenomenon around the world. The aim of this report is to provide an investigative account of one such case of the Kanien'kéha:ka community of Kanesatake, while uncovering the underlying reasons for the Numerous environmental transgressions on their territory. For over 50 years, community members have noticed an increase in the prevalence of diseases, particularly cancer, at unprecedented rates. Through an extensive investigation of literature and interviews with community members, three major environmental polluters in and around the region of Kanesatake were uncovered, including the St Lawrence niobium mine, excessive pesticide use on farmlands and a massive waste dump that continues to accumulate to the present day. Interviews were conducted with community members as part of the Environmental Contaminants and Health Impact Project (ECHIP), which is the first study on environmental contaminants and their potential impacts on the health of community members in Kanesatake. The report finds that institutional abdication of responsibility is a legacy of the colonial system which continues to perpetuate environmental racism and environmental injustice against First Nations communities. Recommendations are made to establish a detailed health-environment database in Kanesatake that can potentially demonstrate patterns related to contaminant exposure and rates of illnesses such as cancer. The wealth of knowledge collected from community members who have been observing the long drawn out effects of contamination for decades, will add to the archival data being established by the community of Kanesatake.

Decolonizing Education: A Case Study of the Environmental Technician Program at Algonquin College from a Settler Perspective (February 2022)

Author: Alexa Mantifel

Employer: Algonquin College: Pembroke, Ontario

Abstract

Both the residential school system and Canadian public education system have been founded using Eurocentric knowledge which denies Indigenous histories, cultures, and knowledge systems. These education systems have therefore been used as a mechanism to assimilate and erase Indigenous peoples, worldviews, and cultures from Canada. However, since the 2015 Truth and Reconciliation Commission reports, government and educational institutions have been taking steps towards decolonization. Today, research has shown that changes are being made in post-secondary institutions with respect to research surrounding Indigenous peoples. However, curricula in educational institutions are still largely controlled by and based upon Western paradigms. Specifically, geography and environmental departments have been identified as fields that need to be decolonized due to the strong connection to land that both these fields and Indigenous epistemologies have. The natural science field and all other post-secondary curriculum must be examined to determine if they are becoming decolonial. To address this issue I explored how the Environmental Technician program at Algonquin College is decolonizing its curriculum and provided recommendations based on literature on how courses can perform this work. Therefore, the goal of this research was to explore if and how the Environmental Technician program at Algonquin College Pembroke is decolonizing its curriculum and provide recommendations on how course curriculum can continue towards this goal. Particularly, the course learning requirements were focused on using keyword searches, with an in-depth review of each courses' syllabi to explore if decolonial or Indigenous content is included in curriculum. Among the 24 courses' syllabi the results indicate that no course syllabi's include the keywords used in this analysis and therefore do not include decolonial content. This research shows the need for work to be done in the environmental fields towards decolonizing curriculum and highlights a methodology that can be used to review and provide recommendations for similar programs to begin decolonizing curriculum.

Critical Review of Parks Canada's Guidelines on Public Consultation in the Detailed Impact Assessment Handbook (March 2022)

Author: Julia Bonaventura

Employer: Parks Canada Agency

Abstract

Public consultation is considered an integral part of the impact assessment (IA) process, because when done correctly it can reduce conflict, lower the chances of legal action, and gives stakeholders the opportunity to share important information about the project to the proponent. Parks Canada Agency is currently developing a Detailed Impact Assessment (DIA) handbook to help IA practitioners implement IAs for projects that may be complex and controversial. DIAs often raise public interest, therefore, strong guidelines for public consultation are necessary. The purpose of this paper is to provide a critical review of the DIA handbook's public consultation requirements in order to answer the question what are the improvements and the potential shortcomings of the new DIA guidelines for public consultation. To answer this question, a framework was developed based on a review of the literature that found five essential elements for an effective public consultation process: 'Early Involvement', 'Inclusive and Representative', 'Inform and Educate', 'Transparency and Trust', and 'Cost-Effectiveness'. This framework was then used to analyze the guidelines for public consultation in the DIA handbook. The Brewster Glacier Skywalk is also examined as a case study to compare to a project done without the DIA handbook. Improvements found in the DIA handbook include early consultation, guidelines for different consultation levels, and promoting the disclosure of information to the public. However, they still lack guidelines on how to choose the engagement level and are not taking advantage of tools such as gender-based analysis plus. Overall, the DIA handbook provides significant improvements from previous guidelines for public consultation during a DIA.

Species at Risk Governance according to Indigenous Perspectives: A Comparative Study between Canada and Australia (March 2022)

Author: Michelle Anderson

Employer: Species at Risk Implementation Division

Abstract

Climate change and anthropogenic effects are increasingly threatening wildlife species around the world. In Canada, Indigenous peoples depend on many species listed under the Species at Risk Act (SARA). It has been deemed that SARA is wholly inadequate in incorporating Indigenous rights and involvement, and often perpetuates colonialism through management practices. In light of Canada's 2016 commitment to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and more recent commitment of Indigenous reconciliation, it is important to evaluate SARA with regards to UNDRIP. Thus, this report utilizes a comparative case study that aims to determine what insights may be gained by compiling and comparing Indigenous perspectives in relation to species at risk governance in Canada, in contrast with Indigenous perspectives of Australia's Environment Protection and Biodiversity Conservation Act 1999 (EPBCA), as Australia's historical colonial governance structure is alike to Canada's. The study categorized perspectives to facilitate comparisons in order to identify critiques and recommendations from each country including: Indigenous rights and Indigenous knowledge (IK); implementation and administration; consultation; as well as language and policy. The main findings provided insights and opportunities for improvements that can be applied to both nations' species at risk governance frameworks. These opportunities included improving SARA's policies and guidelines to be explicit regarding Indigenous participation and integration of IK, the inclusion of Indigenous peoples in the EPBCA's species nomination and listing processes, providing increased funding to Indigenous advisory bodies, proper integration and protection of IK, in addition to the notion of culturally significant species and dual-listing.

Indigenous Participation and Engagement in the Tazi Twé Hydroelectric Project -Did it Contribute to an Effective Environmental Assessment? (March 2022)

Author: Lana Mutassem

Employer: Office of the Auditor General of Canada

Abstract

Indigenous participation is an integral part of the environmental assessment (EA) process and contributes to its overall effectiveness. Research has shown that the Canadian Environmental Assessment Act, 2012 (CEAA 2012), restricted participation in this process. As a result, the report evaluates whether the Tazi Twé Hydroelectric Project in Saskatchewan, Canada was assessed properly in terms of Indigenous participation. This project will answer the question how effective is Indigenous participation in the Tazi Twé Hydroelectric Project? To do so, the Project Description, Environmental Impact Statement, final EA Report, and Decision Statement were analyzed to determine whether the participation process utilized four best practices: (1) early involvement, (2) influential and collaborative, (3) inclusion of Traditional Knowledge, and (4) representation. This analysis displayed that the first three best practices were not utilized fully. Meanwhile, the fourth best practice was altogether neglected. These findings point towards overall ineffective Indigenous participation and therefore an ineffective EA process. While these findings are concerning since EA is seen as an important environmental protection tool, more studies are needed to evaluate the effectiveness of the EA process. These studies should include different scales, industries, and EA components. Nonetheless, this study does improve awareness of these issues. This helps bring into light the importance of ensuring meaningful and proper participation as it represents a step towards true reconciliation with Indigenous Peoples in Canada.

Are Canada's Species at Risk Ready for Protection? An Assessment of Critical Habitat Identification Practices under the Federal Species at Risk Act (March 2022)

Author: Chantal Ménard

Employer: Canadian Wildlife Service, Species at Risk Implementation Division

Abstract

As Earth enters its sixth mass extinction, it is imperative that species and their critical habitats are protected. Despite the Canadian Species at Risk Act (SARA) requiring critical habitat identifications in recovery documents, identification methods have been deemed inadequate, leading to a backlog of species with unprotected critical habitat. This study aims to answer the following: how can critical habitat identification practices be improved and efficiencies be made such that Canadian species at risk (SAR) practitioners can successfully tackle the backlog of species with critical habitat to be protected on federal lands? This is answered through a case study that investigates 73 species to evaluate if they are ready for protection. An internal assessment tool, developed by SAR practitioners, was utilized to classify species based on their recovery document(s)' ability to identify critical habitat. These results were analyzed via a Strengths, Weaknesses, Opportunities and Threats analysis. As a result of this assessment, 17 of these species' critical habitat identifications were deemed ready for protection, while the remaining were classified as needing edits. Predominant issues included map quality and biophysical attribute enforceability. While there are collaborative opportunities to address these issues, the completion of these orders remains threatened by limited resources and legal pressures. This study recommends a critical habitat-based approach, multispecies protection, standardized identification procedures, and greater funding to tackle the backlog. These improvements are not only crucial to legally protect critical habitat, but also to promote greater understanding of species' needs during impact assessments of project developments.

Sustainability Indicators (SIs) for Municipalities, a Canadian Case Study: The National Climate League (March 2022)

Author: Margo Burgess-Pollet

Employer: The Climate Reality Project Canada

Abstract

Although climate change is a global problem, the local municipal level has been identified as a key to developing and implementing solutions. One tool that has emerged and received growing attention is the development and use of sustainability indicators. This paper aims to answer the research question: "What are the benefits and limitations of developing and measuring Sustainability Indicators for Canadian municipalities?". It presents a comparative analysis of recommended sustainability indicators in two identified themes: "Waste" and "Urban Greenness". Sustainability indicators from the National Climate League (NCL), a Canadian citizen-led datacollection project running since 2018 in municipalities, have been reviewed and compared to two sources. The first one is a grey literature source: "The European Handbook's recommendation of sustainability indicators" (Siragusa et al., 2021), and the second one is an academic source, "Measuring the sustainability of cities: An analysis of the use of local indicators" (Tanguay et al., 2010). The comparative analysis resulted in three recommendations to improve the NCL detailed in this paper, and three key conclusions about sustainability indicators (SIs). First, SIs are more efficient when coupled with objectives to be met. Second, SIs measured individually will likely not provide the full reality of a city's sustainability. SIs likely coexist and need to be considered as such. Third, and most importantly, despite their identified limitations, sustainable indicators can play the important role of empowering municipalities and citizens to advocate for and implement change on a local scale, which will make a difference on a global scale.

Asserting Indigenous Rights in Canada: A Critical Analysis of the Implementation of the UNDRIP through Regional Assessments (March 2022)

Author: Mathilde Butler

Employer: First Nations of Quebec and Labrador Sustainable Development Institute (FNQLSDI)

Abstract

As part of the 2016 federal commitment made by Justin Trudeau to implement the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the Government of Canada began to amend supporting pieces of legislation, including the Canadian Environmental Assessment Act of 2012 (CEAA12). The legislation was replaced in 2019 with the Impact Assessment Act (IAA19), which includes several sections on regional assessments (RAs). According to impact assessment (IA) experts, RAs aim to provide an opportunity to assert Indigenous rights, and to build Nationto-Nation relationships between the Government of Canada and Indigenous peoples across the country; however, discontent has been expressed during, and following the completion of the Regional Assessment of Offshore Oil and Gas Exploratory Drilling East of Newfoundland and Labrador. This apparent gap between federal pledges and the extent of the assertion of Indigenous rights within RAs led me to ask the following: to what extent are Indigenous rights asserted through regional assessments (RAs) under the Impact Assessment Act (IAA19)? This report assesses the extent to which eight rights from the UNDRIP that are specifically relevant to the field of IA, such as the right to financial assistance and the right to free, prior, and informed consent, have been implemented within the sections of IAA19 that pertain to RAs, along with the extent to which they have been put into practice in the report of the RA mentioned above. Findings reveal that the right to financial assistance is the only criterion of analysis that has been entirely implemented within the IAA19, whereas none of the selected rights from the UNDRIP were fully put into practice in the case study.

Taking the Next Boat to Net-zero: A Review of Alternative Marine Propulsion Options Heeding Canada's Emission Reduction Targets and Fleet Renewal Plans (March 2022)

Author: Anna Newton

Employer: Canadian Coast Guard

Abstract

In the last century, anthropogenic climate change has delivered surging global surface temperatures, droughts, floods, erosion, shrinking sea ice extent and rising sea levels. To mitigate the impacts of climate change, governments are taking action to reduce future greenhouse gas (GHG) emissions through alternative energy development and decarbonization efforts. With Canada's National Shipbuilding Strategy driving the renewal of Canada's federal fleet, and nationally determined GHG reduction targets set for 2030 and 2050, the Canadian Coast Guard (CCG) is committed to improving vessel efficiency and reducing emissions. In order to achieve these targets, CCG, along with the rest of the marine industry, is currently evaluating potential decarbonization pathways. The core research question driving this report is: What are viable alternative fuel options for decarbonizing CCG's future fleet in consideration of Canada's 2030 and 2050 emission reduction targets? This report reviews alternative propulsion types such as liquefied natural gas (LNG), ammonia, methanol, hydrogen, nuclear, and renewable energy (i.e. wind, solar, biofuels), and related measures to optimize vessel performance. The marine industry is in the early stages of decarbonization planning. Until a viable propulsion alternative has been demonstrated and proven many times over, with readily available bunkering infrastructure, CCG will likely continue to utilize marine diesel oil (MDO). In the short-term, while other alternative energy technologies are being developed, drop-in fuels such as biodiesel and renewable diesel appear to be the most viable solutions to decarbonize CCG's future fleet due to their engine compatibility and high GHG emissions reduction capacity.

The Cost of Regulatory Non-Compliance: An Analysis of United States Federal Environmental Legislation and the Deepwater Horizon Oil Spill (April 2022)

Author: Alessandra Szilagyi

Employer: Nimonik, Inc

Abstract

Regulatory compliance is a key component in preventing environmental disasters since it holds the governments and industries accountable for complying with regulations. When regulatory compliance fails, devastating disasters occur which lead to deaths and adverse environmental impacts. In 2010, the Deepwater Horizon oil spill killed 11 workers and released 49 million barrels of oil into the Gulf of Mexico. Investigations into the oil spill noted that a lack of regulatory enforcement and violating regulations were factors that led to the explosion. The purpose of this report is to determine whether regulations provided sufficient information for federal agencies and for BP to comply with. To answer the question, "Was BP properly equipped to achieve regulatory compliance, or did the Minerals Management Service (MMS) fail in overseeing BP's work?", I analyze and evaluate the United States (US) Codes and Codes of Federal Regulations (CFR) that were relevant to the oil spill. Using a classification system, I determine which clauses in the legislations are provisions that must be complied with, and then I identify recurring keywords that indicate whether these provisions are directed towards government or non-government entities. The classification shows that the Codes contain more provisions for government entities, while the CFRs are directed towards non-government entities such as owners and operators of corporations. Although US environmental legislation does contain sufficient clauses for federal agencies and corporations to comply with, barriers such as corporations cutting costs, and federal industries being influenced by the oil industry ultimately restricts the capacity for full regulatory compliance.

Roles of the Land Code in Indigenous Land Sovereignty and Reconciliation -Including a Case Study of Brunswick House First Nation's Land Code Development (April 2022)

Author: Fiona Wirz-Endrys

Employer: Odonaterra Inc.

Abstract

The First Nations Land Management Act (FNLMA) was passed in 1999 and has made it possible for First Nation communities to sign a Framework Agreement (FA) allowing them to make their own laws on-reserve. Today, 190 First Nations in Canada are signatories of the Framework and 98 are operational with their own Land Code. Current available literature on the Land Code outlines economic opportunities and highlights the lack of information available for First Nations and Canadians about the Land Code. Further literature about cultural and social benefits of the implementation of the Land Code, remains limited. As a result, this report aims to reveal any cultural and social impacts on First Nation communities that have not been widely discussed. To help reflect these impacts, a case study of Brunswick House First Nation (BHFN) is used as an example of how the incorporation of cultural concepts have helped shape the Land Code. The report summarizes the resulting community impacts as told by BHFN members through community interviews. Results from the interviews show that cultural incorporations into law have stimulated further engagement and cultural teaching of members, furthering community ownership of self-government. Additionally, young families have mentioned seeing a future in their community and moving back to the reserve through increased community engagement. Lastly, members recall feeling more respected among neighbouring jurisdictions, and see further opportunity to expand their leadership to activities off-reserve in the future, through increased capacity building from Land Code development. The results show that social and cultural impacts from the Land Code development have played a vital role in BHFN's community growth. It is an example of how the Land Code has the potential to move Canada toward Indigenous land sovereignty and reconciliation.

Precipitation Changes in PEI: An Analysis of the Provincial Government's Decision to Lift the High-Capacity Well Moratorium (April 2022)

Author: Jaime Malone

Employer: Trout River Environmental Committee

Abstract

In 2002, the Prince Edward Island (PEI) provincial government enacted a moratorium on the use of high-capacity wells for agricultural irrigation to protect water resources. The moratorium was overruled in June 2021 through the implementation of the Water Act. The moratorium was lifted as the agricultural industry experienced an increased need for groundwater irrigation; this decision was made under the pretence that local levels of precipitation have declined and are expected to decrease further. This report investigates the changes in PEI's precipitation and temperature levels from 1946 to 2019 to determine if climate change is the leading cause of the increased need for agricultural irrigation. The analysis uses Pearson's Correlation Coefficient to determine if precipitation has significantly decreased or in temperature has increased to the point where natural irrigation is no longer effective. Based on the results, there is insufficient evidence to suggest that precipitation significantly decreased or that temperature has reduced the effectiveness of natural irrigation. As opposed to climate change, this study suggests that a decline in soil quality and soil nutrients, due to poor land management and harmful agricultural practise, is likely the main culprit of increased irrigation needs. This assumption is made based on the results of soil samples that were taken across the island over the past two decades, which showed a significant decline in soil nutrients. To promote the precautionary principle, it is suggested that the moratorium be reinstated until scientific analyses, such as a Regional Environmental Assessment (REA), are conducted to ensure the environmental and socioeconomic protection of the region.
An Evaluation of the Quality of Road Mortality Assessment in Quebec EIAs (April 2022)

Author: Oriana Meek-Sauriol

Employer: Canadian Centre for Evidence-Based Conservation, Institute of Environmental and Interdisciplinary Sciences

Abstract

The goal of this study was to evaluate the assessment of road mortality in Quebec Environmental Impact Assessments (EIAs). To do so, a sample of 11 EIA projects was chosen from the provincial and the federal EIA registry. A total of seven evaluation criteria was established based on the literature and the quality of road mortality assessments for amphibians and reptiles, birds, small mammals, and large mammals was evaluated separately. Scores were attributed by reading through the Environmental Impact Statement (EIS) reports for each project. Road mortality for birds was only mentioned in one of the reports, and the maximum relative score obtained for amphibians and reptiles was 6.7 out of a possible score of 100. Large mammals was the most assessed class (maximum relative score of 33.3), followed by small mammals (maximum relative score of 10). Future road mortality assessments should focus on all classes of wildlife present in the study area. Very few projects proposed species-specific mitigation measures, and none of the projects included any data collection for road mortality. There is a need for more studies on the effectiveness of mitigation measures for specific species, as they can respond in different ways to various mitigation measures. Furthermore, road mortality data should be collected prior to, during, and after the construction or modification of a road. This could be used to determine hot spots and hot moments of road mortality, providing vital information on the most effective locations and types of mitigation measures.

Enforcing Water Pollution Laws – Can Canada Do Better? (April 2022)

Author: Fatima-zohra Makhtoum

Employer: Environment and Climate Change Canada

Abstract

This report is an examination of Environment and Climate Change Canada's (ECCC) enforcement approach regarding the pollution prevention provisions of the Fisheries Act, with the purpose of demonstrating trends and making links between policy and compliance. This study addresses two main questions: 1) How has ECCC conducted its enforcement program and responded to environmental infractions related to the Fisheries Act pollution prevention provisions over the last decade?, and 2) Are there links between enforcement activities and outcomes? The methodology followed mirrors the two-step approach most common in the literature, and consists of first providing a descriptive analysis of overall enforcement trends under the provisions, followed by a regression analysis of specific variables to determine any existing relationships between enforcement inputs and outputs in one particular sector under the Act. Findings reveal that enforcement activities have generally decreased over the last ten years, and that a shift in policy in 2015 has resulted in a more aggressive approach towards environmental harm. However, no firm conclusion can be made on the effectiveness of this new approach in protecting water resources due to its infancy as well as incomplete data. Findings also reveal that inspections and warnings have no direct effect on plants' violations in the mining sector. In order to fully unravel the relationships between policy and compliance, it is recommended that ECCC improves its tracking of enforcement activities and alleged violations by specific facility site in order to have a comprehensive understanding of compliance by entity and by period.

The Inclusion of Homeless Populations in Social Impact Assessment Processes in Canada (April 2022)

Author: Avery Tyrell

Employer: WSP

Abstract

This report is intended to make a case for the inclusion of homeless people in the impact assessment process, specifically through consideration in Social Impact Assessment (SIA). SIA is better suited to handling social issues arising from development compared to Environmental Impact Assessment (EIA), which focuses primarily on ecological matters. Canada is facing a homelessness crisis that has been ongoing since the 1980s. Various federal, provincial, and municipal plans have been enacted over the years to end homelessness in some form but have met with varying degrees of success. This is due to several interacting institutional, social, and economic factors, as well as a lack of cohesion between mitigation efforts. Canada's current plans to alleviate the homelessness crisis at the federal, provincial, and municipal levels are still undermined by socially unsustainable practices caused by an exclusion of the homeless from the policy and developments that may adversely affect them, and contribute to their systemic exclusion from society. Considering this, it is reasonable to expect that homeless people should get the same considerations as other vulnerable members of the public in SIA. Despite this however, based on review of examples of EIA and SIA legislation in Canada, they are not consistently granted such consideration. Impact assessment should be improved to better consider and minimize harm against the homeless population by specifically including them in SIA legislation and guidelines, and potentially coordinating with overarching government goals to address the homelessness crisis in providing funding or socially assisted housing.

Maintenance & Restoration of Ecological Integrity in Canadian National Parks: An Evaluation of Banff National Park's Ecological Restoration Efforts at Two Jack Lake, Alberta (April 2022)

Author: Rain Noakes

Employer: Banff National Park, Alberta: Parks Canada

Abstract

Parks Canada Agency (PCA) is mandated under Canadian federal policy to establish and implement robust, science-based, conservation, ecological restoration (ER) and ecological integrity (EI) monitoring programs (Department of the Environment Act, R.S.C., 1985, c. E-10). PCA is tasked with the protection of over 450,000km2 of crown land; as such, I believe the agency should be held to the highest established standard. The PCA has access to substantial capital (e.g. 3 billion infrastructure budget over five years, Environment Climate Change Canada 2020) and resources and are well positioned to be leaders in ER and EI monitoring. This research paper examines the extent to which PCA is fulfilling their mandate to establish and implement effective ER and El programs and how current legislation and PCA management practices may be influencing the agency's effectiveness in maintaining and restoring the ecological integrity of Canadian national parks. A literature review indicated the 5-Star Recovery Wheel (the Recovery Wheel) established by the Society for Ecological Restoration International is the most comprehensive, widely used, and consistently cited methodology for evaluating the success of any ER project (Gerwing et al., 2021). These criteria were applied in a case study to evaluate the success of ER efforts by PCA in Banff National Park (BNP) to answer the research question: Is the PCA successfully fulfilling its mandate to establish and implement effective science-based monitoring programs according to the highest currently accepted standard? The 5-Star system was used to analyze the success of monitoring systems in place at selected ER sites managed by BNP. I propose that PCA adopt a model of concrete indicators and monitoring metrics similar to the Recovery Wheel for ER sites from pre-planning to monitoring as a method to improve the agency's success along a trajectory to recovery.

The Usage of Mapping & Participatory Mapping in Canada's Indigenous Communities: Barriers and Solutions (April 2022)

Author: Maryam Amini

Employer: Grand Treaty #3: Territorial Planning Unit

Abstract

Maps have a long history of being used to push colonial agendas forward and historically bore a bad reputation for the Indigenous Peoples in Canada. However, with the expansion of map usage in Canada's more contemporary history and its capacity to facilitate Indigenous community objectives, maps are now being viewed as an effective tool to achieve these objectives. This report aims to explore the important usages of mapping in Indigenous communities of Canada. discuss its challenges and setbacks, and suggest solutions to help address them. This will be achieved through responding to two research questions: 1 - What is participatory mapping and how has it contributed to Indigenous community projects? and 2 - What are challenges of participatory mapping and how can they be addressed? This was done by studying the literature in this field and after providing a brief introduction of the history of mapping worldwide, focusing on the Canadian Indigenous context and introducing some common map usages in the past fifty years. The chosen case study was the Inuit Land Use and Occupancy Project that is a successful example of participatory maps usage, particularly map biographies, to facilitate the greatest land claim in Canada's Indigenous history. This report found that although participatory mapping is an effective way to collect, record, and represent knowledge and has greatly enhanced reaching various objectives, it also comes with great challenges. Examples are misrepresentation of Indigenous knowledge, ownership issues and lack of Indigenous involvement. In conclusion, some solutions to these challenges are suggested.

The Consideration of the Protection of Critical Habitat for Species at Risk in Environmental Assessment: A Case Study of the Milton Logistics Hub Project in Ontario (April 2022)

Author: Joëlie Lecompte

Employer: Canadian Wildlife Service, Environment and Climate Change Canada

Abstract

Habitat loss is the largest contributor to wildlife population declines in Canada; with continued human developments it is increasingly important that strong legislation is in place to protect and recover species at risk and critical habitat. It is also vital that potential impacts to species at risk and their critical habitat are considered in project development. This study addresses two main questions: 1) How does the provincial Endangered Species Act in Ontario compare to the federal Species at Risk Act, regarding the protection of critical habitat?, and 2) How does the actual consideration of critical habitat protection manifest in environmental assessments in Ontario? Current literature and government guidelines were reviewed to compare provisions under the Species at Risk Act and the Endangered Species Act. An analytical framework was used in a case study of the Milton Logistics Hub project to evaluate how critical habitat and species at risk were considered in an EA in Ontario under the Canadian Environmental Assessment Act (2012). Although there are general prohibitions for the protection of species at risk and critical habitat in federal and provincial legislation, there are important delays in the protection of critical habitat after listing, and the federal government is not using its safety-net provisions to the best extent possible. More federal-provincial collaboration is required if Canada's conservation goals are to be met, and updated guidelines are needed for ecological assessments. The case study demonstrated that it is possible to effectively consider species at risk and critical habitat in EA, although there is a need for more science-based mitigation and standardized monitoring.

Investigation into the Effectiveness of Canadian Impact Assessment in Managing Air Quality Effects on Human Health (May 2022)

Author: Patrick Moullas

Employer: S2S Environmental Inc.

Abstract

Degraded air quality is well known to causes adverse effects on human health; therefore, efforts should be made to improve air quality. The Milton Logistics Hub (the Project) underwent Panel review under the Canadian Environmental Assessment Act 2012 and was determined to have significant adverse effects on air quality and on human health. This paper was guided by the following research question "How well suited is Impact Assessment (IA) to address air quality concerns?" Canadian federal Occupational Health and Safety (OHS) and environmental regulations associated with air quality were reviewed and used to inform analysis. Diesel exhaust emissions from transport trucks are the primary source of contaminants of potential concern including benzo[a]pyrene, benzene, particulate matter, and nitrogen dioxide which were noted to exceed thresholds when compared to most stringent criteria. Through evaluation of the surrounding legislative context, Project IA findings, and consideration of pragmatic possibilities for improvement given the current state of the Impact Assessment Act (IAA), a collaborative responsibility framework is proposed to be applied by the Impact Assessment Agency. It is argued that through professional managerial efforts, the Agency can create opportunities for substantive collaboration with experts from other agencies such that all parties can further their goals - for example Health Canada could have used Project IA as an opportunity to review health risks associated with diesel exhaust in collaboration with the proponent if engaged early. This type of collaboration could organically improve IA outcomes through a holistic approach. As such, it is recommended to be critical of the Agency given current opportunities for improved practice.

Tracking Sustainability, Indigenized and IA Curriculum in Higher Education (September 2022)

Author: Noelle Racine

Employer: Office of Sustainability, Concordia University

Abstract

The field of impact assessment (IA) in Canada is highly multi-disciplinary, involving stakeholders with varied backgrounds in the fields of both the physical as well as social sciences. IA practitioners find themselves with the responsibility of upholding good earth stewardship, supporting development practices to inform decision-making and consulting with Indigenous peoples. Given the varied nature and importance of these roles, it is critical that IA practitioners come from the type of robust educational background that enables them to perform these jobs ethically and efficiently. This paper aims to assess the extent to which sustainability, IA and Indigenous-inclusive curricula have been adopted by post-secondary institutions in Canada. Sustainable courses inventories posted online as part of the Sustainability Tracking, Assessment and Rating System (STARS) were collected from 22 Canadian universities. A keyword analysis based on courses descriptions and titles was conducted and courses with indigenous and IA content were recorded. École de Technologie Superieure (200%), Wilfrid Laurier (150%) and McGill University (100%) experienced the highest growth for indigenized curriculum since their first submission under STARS. Wilfrid Laurier (733%), University of Victoria (637%), and University of Saskatchewan (621%) experienced the highest growth in terms of IA curriculum since their first STARS submission. Overall, results indicate more growth in the sustainability and indigenized courses than IA. Major challenges to address are the lack of overarching support for pedagogical development in IA and indigenized curricula and lack of accessibility to specialized programs inter-departmentally. Go back to Table of Contents

Assessment of the Canadian and Quebec Greenhouse Gases Reporting Program (February 2021)

Author: Thomas Goetz

Employer: Oxia-Initiative

Abstract

The changes observed in the planet's climate since the beginning of the 20th century are mainly due to human activities that emit greenhouse gases (GHG) into the atmosphere, increasing heat trapping and raising the average temperature on the Earth's surface. An accurate and rigorous GHG emissions quantification system is essential for making informed decisions on climate change. For this reason, there are widely recognized GHG quantification standards, such as the GHG Protocol or the International Standard Office (ISO) 14 064. Accordingly, this report bases its methodology and analysis on the principles established by the above-mentioned entities. Therefore, the central question of this research is "whether Canada's and Quebec's GHG quantification programs are aligned with recognized international GHG quantification standards". To address this question, the report provides a context for the GHG situation in Canada and Quebec. This is followed by an analysis of the reporting policies of both jurisdictions. Finally, the report provides a critical analysis of the quantification systems and assesses their strengths and weaknesses. The Canadian and Quebec programs appear to be well adapted and detailed according to the sector of activity of the companies subject to the program. It also appears that both programs are standardized between the two jurisdictions. On the other hand, their scope of application is too narrow, which leaves out a large part of GHG emissions. Finally, they are not fully aligned with the reporting standards of ISO and the GHG Protocol and can still be improved.

Climate Change Considerations in Strategic Environmental Assessments: Global Affairs Canada and International Trade Negotiations (March 2021)

Author: Aidan McGillis

Employer: Cooperation Canada

Abstract

International trade agreements have expanded exponentially across the globe in the past half a century, bringing along with them unprecedented economic prosperity but also ever-more widespread environmental degradation. The climate change implications of international liberalized trade are well documented, and though significant time is spent in the media discussing the issue of climate change, there is little sign that the situation will find a truly substantive resolution anytime soon. The strategic environmental assessment (SEA) framework provides a comprehensive and systematic approach to evaluate the climate change impacts of proposed trade agreements in Canada as handled by Global Affairs Canada. This tool is integrated early in planning, increasing the likelihood that environmental impacts will be evaluated within the formative stages of trade negotiations. This paper aims to examine what climate change considerations are addressed in SEAs of trade agreements, as well as how these climate change considerations are addressed. Climate change evaluation criteria are developed and applied to two final strategic environmental assessment reports conducted by Global Affairs Canada to establish what considerations are incorporated, as well as how they are incorporated. This paper concludes that strategic environmental assessments are effective in incorporating climate-related considerations; however, there are opportunities to improve how climate-related objectives, monitoring and reporting of climate impacts, as well as consultation are included as part of these assessments.

Indigenous Data Sovereignty in Canadian Impact Assessment: A Thorny Path in the Operationalization of Indigenous Rights (March 2021)

Author: Mariana Liberman

Employer: Grand Council Treaty #3: Territorial Planning Unit

Abstract

Indigenous Data Sovereignty (IDS), or the right to self-govern Indigenous data and Knowledge, is a long-standing vindication. In Canada, OCAP© principles (Ownership, Control, Access, and Possession) are used as its operationalization tool. International commitment to the United Nations Declaration on Rights of Indigenous People (UNDRIP), reinforced by the present Canadian Government and Indigenous organizations' work, has built momentum to achieve IDS concrete instrumentalization in regulations. The recent Impact Assessment Act (IAA2019) has considerably reflected the call to a more integrative approach with Indigenous claims. However, the provisions for Indigenous data and knowledge management are diffuse in the Act. Data, Knowledge, and geographical information follow different management guidelines that clash with Indigenous understanding of data governance. The analysis of several projects available in the Impact Assessment Agency of Canada's Registry (IAAC) has revealed additional rules and considerations concerning a practical implementation of IDS principles and concrete examples to draw the issues described in this report. Inconsistencies between Acts, definition issues, lack of collaborative approach are some of the obstacles that jeopardize the effective implementation of OCAP© and other data governance instruments in the Impact Assessment (IA) process. Although this research shows that the pathway to honouring IDS in the Impact Assessment is thorny, political commitment, technological development, and a shift in data management and top-down cartographic paradigms can push positive changes.

Making Sense of ESG Reporting, an Investigation using Case Studies from the Renewable Energy Industry in Canada (March 2021)

Author: Luke Maybury

Employer: Sustainable Investing Project, Concordia University

Abstract

Environmental, social and governance reporting is a new trend in the business world which provides external stakeholders a snapshot of a company's efforts (be them positive or negative) to address their environmental, social and governance concerns. This report introduces ESG reporting, discusses how reports are measured and demonstrates this in practice with three strategically selected companies in the renewable energy industry (TransAlta, Boralex and Innergex). These ESG reports are compared and contrasted with the goal of identifying a top performer (Innergex) for a would-be investor building an ethical savings fund. This is accomplished using a bespoke qualitative and quantitative matrix where the three reports are scored using commonly compared ESG metrics, industry best practices and voluntary standards. The results of this study show that even in industries that have positive environmental impacts such as renewable energy, ESG reporting is still inconsistently applied, some misleading claims are included, and the information disclosed varies between companies. Ultimately, the paper concludes that there is much to be desired in ESG reporting, and these shortcomings make it challenging for consumers and competitors to assess the impact of the companies in question. Informed by an extensive literature review and the case study analysis, potential solutions to improve ESG reporting are presented including publishing carbon footprints, implementing science-based emissions reduction targets and adopting a "triple bottom line" approach to improve both ESG reporting and ESG performance.

Sustainability in Canadian Higher Education Institutions: A Comparative Analysis of Waste Management Policies and their Contribution to the Sustainable Development Goals (March 2021)

Author: Jenny Paola Espitia Contreras

Employer: Zero Waste Concordia Program

Abstract

Higher Education Institutions (HEIs) play a pivotal role in the achievement of the Waste-related Sustainable Development Goals (WSDGs). On the one hand, as part of their day-to-day operation, they produce direct environmental impacts derived from waste generation and disposal in landfills. On the other hand, HEIs educate students, staff, faculty, and the society on sustainability values and practices through their curriculum, research, and community outreach. This report analyses waste management (WM) policies and zero-waste initiatives implemented at Thompson Rivers University, Université de Sherbrooke, and Concordia University to identify and assess whether and how they contribute towards the achievement of the WSDGs. Indicators derived from the Sustainable Development Goals (SDGs) Integration Process were used to evaluate data collected from these HEIs' latest STARS reports and their sustainability documents and webpages. The analysis revealed that HEIs are actively working on the integration of the WSDGs on their research, stakeholder's engagement, and campus operations management activities, but none of them has fully completed all the SDGs Integration levels. This finding confirms that the achievement of the WSDGs in HEIs is an ongoing process where each institution must adapt its governance structures and policies to its particular situation and challenges. On this basis, it is important for HEIs to restructure their WM policies by emphasizing on which WSDGs they are contributing to as well as redesigning initiatives and campaigns to prioritize waste reduction and stress its importance. Moreover, institutions should monitor WM performance using metric-based goals for ensuring transparency and provide frequent, complete, and accurate sustainability reports.

The Limitations of Public and Indigenous Engagement for Nuclear Waste Projects under CEAA 2012: An Analysis of the Near Surface Disposal Facility (March 2021)

Author: Kendra Warnock-Juteau

Employer: Canadian Nuclear Safety Commission

Abstract

Many developed and developing countries have made pledges and taken steps toward decreasing greenhouse gas emissions in an effort to limit the increase of global mean surface temperatures. Research has shown that, as a low-carbon source of energy, nuclear power could play a key role in the transition to a cleaner energy future. However, nuclear facilities produce waste products that can remain radioactive for hundreds of years. This waste has to be contained, disposed of, and left undisturbed until the radioactivity has decreased to levels that will not put the environment and human health as risk. Public concerns over potential future contamination and facility malfunctions have made siting nuclear waste a difficult process, both within Canada and abroad.

Environmental assessments are planning-tools that can be used to assess the potential impacts of proposed nuclear waste projects. However, for the assessment to thoroughly consider all potential impacts of a project, meaningful public engagement must be conducted. Research has shown that to achieve meaningful participation, the engagement process must be open and transparent, allowing for two-way dialogue and early engagement opportunities. The process must also be context-oriented and consider the concerns and knowledge of all stakeholders involved. Moreover, meaningful public participation should be adaptive and allow for the public and Indigenous groups to influence and participate in the decision-making process.

This report will assess Canadian Nuclear Laboratories' proposed Near Surface Disposal Facility Project, which is a proposed nuclear waste project for the disposal of solid, low-level radioactive waste in Renfrew County, Ontario. The proposed project will be evaluated against recognized best practice principles to identify key limitations to meaningful public and Indigenous participation for nuclear waste projects under the Canadian Environmental Assessment Act, 2012. The findings from this case study suggest that key limitations include a lack of specific guidance for the communication of project information, no requirement for proponents to seek out and consider Indigenous knowledge in their assessments, and inadequate consideration of public concerns. Key lessons learned call for a strict requirement for the consideration of Indigenous knowledge throughout the assessment, additional guidance on two-way dialogue, and the obligation for early and sustained engagement opportunities.

LUST The Silent Killer: Effects and Regulation for Leaking Underground Storage Tanks (March 2021)

Author: Brendan Callaghan

Employer: Terrapex Environment Ltd.

Abstract

Climate change perpetuated by fossil fuel use is arguably the most significant threat to modern society. Unfortunately, both the transportation and the electricity production industry remain heavily reliant on fossil fuels. These fuels are typically stored in underground storage tanks (UST) which over time can corrode or leak leading to significant human and environmental health effects. This report provides a critical analysis of the regulations that govern underground storage tanks within Canada to determine the extent to which they protect humans and the environment against the impacts of leaking underground storage tanks (LUSTs). A meta-analysis of the regulations on USTs within Canada was performed by first researching government sites and academic articles within pertinent journals for relevant information. A case study review of an audit on Montreal's USTs assessing regulation compliance was then performed. This report concluded that many of the current regulations such as corrosion protection, leak and overfill prevention are generally sufficient to protect against possible spills or leaks. However, improved regulatory compliance and follow-up are required to ensure adequate protection is achieved. Suggested improvements include the creation of databases to centralize information and improve certification scheduling. Additionally, an obsolescence and preventative maintenance management plan should be implemented. These management plans would be used to track tank maintenance and replacement schedules to improve monitoring and better prevent potential leaks.

After Environmental Assessment: Compliance Obligations in Industry (April 2021)

Author: Sydney Sybydlo

Employer: Nimonik Inc.

Abstract

Facing a climate emergency, it is imperative to understand the contents of Canadian environmental law and what those laws obligate citizens and companies to do. Equally important is understanding how environmental assessment (EA) can foster compliance with environmental obligations, ultimately as it relates to mitigating the effects of climate change. At present, EA suffers from insufficient considerations of cumulative effects as well as difficulty in enforcing monitoring and follow-up activities. To better understand this issue, a sample of environmental laws are drawn from Nimonik's database and their clauses are analysed for the number of specific obligations they contain and what environmental topic they relate to. Two completed EAs are used as case studies and their EA Decision Statements are also analysed and compared with the obligations in environmental laws. The results display an uneven distribution of topics amongst the obligations contained in legislation, with the majority of obligations being related to environmental and hazardous materials management. This distribution is not indicative of those specific aspects being legislated, due to the interactive nature of environmental topics. The case studies illustrate the focus that EA has on specific environmental components that are not easily legislated at the federal level, and how that focus could relate to more effective environmental compliance through specific control obligations and monitoring requirements. Successive restrictions on what projects are considered eligible, however, diminishes the effect EA can have nationally. Cumulative effects assessment in federal EA is still too recent to analyse in a meaningful way, however alternative EA processes in place appear adequately equipped to conduct such assessments.

Adapting to Climate Change through Regional Land Use Planning: Comparing the Adaptive Capacity of Arctic Indigenous Communities in Canada (April 2021)

Author: Gillian Griffin

Employer: Crown Indigenous Relations and Northern Affairs Canada: Environmental

Abstract

Canada's Arctic is warming at three times the rate as the rest of the world, however adaptation strategies can protect the interests of Indigenous peoples who live there. Regional land use plans (RLUP) are an efficient and sustainable way to manage land and resources in Canada's three territories and offer the tools for adapting to climate change. RLUPs designate where extractive projects can occur, however climate change generates problems when land use designations remain static and are thus unable to account for predicted changes in biodiversity. This report asks whether or not RLUPs in Canada's Arctic provide an effective adaptive framework for addressing climate change, and which legislations contribute to an effective and sustainable RLUP. A qualitative analysis of the RLUPs, the guiding legislations and supporting documents associated with the plans, revealed that RLUPs in the Yukon offer the most robust legal framework for providing Indigenous groups the authority to effectively manage their land against the impacts of climate change. This is accomplished through the land use planning process set out in chapter 11 of the Umbrella Final Agreement and in the comprehensive land claim agreements (CLCA). RLUPs in Nunavut and the Northwest Territories are at a disadvantage for an effective adaptation framework from the outset of the planning process due to Nunavut not having a completed devolution agreement and the requirement of the Crown's approval in both territories.

Offsetting our Loss: Biodiversity Offsetting within the Canadian Environmental Regulatory Regime (April 2021)

Author: Kristin Helias

Employer: Canadian Wildlife Service

Abstract

Global rates of biodiversity are undergoing steep declines and biodiversity offsets are increasingly being used to facilitate development while promising to negate their harmful effects. Biodiversity offsets have been legitimized within the Canadian environmental policy regime by their inclusion in such policy and guidance documents as the Federal Policy on Wetland Conservation, the Operational Framework for Use of Conservation Allowances, and the *Fisheries Act*. The offsetting process is complex, and its use is controversial within the scientific community due to ethical considerations and knowledge gaps that persist with regards to science and technical aspects. In addition, implemented biodiversity offsets have been notoriously difficult to evaluate and many of those which have been assessed have demonstrated poor results. A recently proposed policy under the federal Species at Risk Act devotes an entire annex to the use of biodiversity offsets within permit applications. Using indicators established by the Business and Biodiversity Offsets Programme, an analysis of this proposed policy was undertaken to identify weaknesses that could lead to the implementation of flawed offset actions. Out of a total of 40 indicators, 45% were shown to be explicitly referenced within the policy document. The remaining 55% of indicators were not addressed in a manner supportive of effective offsets. The analysis led to the creation of seven (7) recommendations concerning stakeholder involvement, the landscape context, the approach to no net loss, the identification of leakage, the notion of free, prior and informed consent of Indigenous peoples, identification of risk, and providing greater transparency.

Examining the use of Communications Practices for the Promotion of Environmental Education of Climate Change (April 2021)

Author: Antonia Macris

Employer: United Nations Secretariat of the Convention on Biological Diversity

Abstract

This report presents a qualitative analysis on the use of communications practices to promote environmental education (EE), with a focus on climate change issues. The use of communications is an essential component to instill the mobilization of EE and pro-environmental orientation and prioritization for the public. Strategic communications practices used to promote EE can help increase public awareness and engagement. The research question explored is "How are communications practices used to promote environmental education about climate change?" Two case studies are used to showcase intergovernmental interventions and federal public information campaigns. A qualitative thematic review is conducted on the literature of communications theories in support of EE promotion of climate change. Common techniques and concepts emerged as strategic communications practices, from which a list of assessment criteria was developed and applied to both case study areas across three main categories of environmental education, environmental communication and the 5D Staged Approach to Change. Each strategic communications practice criterion was met and present within the application for EE promotion of at least one case study. The application of intergovernmental interventions met eight of eleven criteria, while the application of federal public information campaigns met only six. Three criteria were present at both international and federal levels: 1) awareness of environmental challenges; 2) knowledge and understanding of these challenges; and 3) access to informational resources, knowledge and actionable practices. Findings reveal the strategies currently used and which should be implemented at each level to improve the promotion of EE of climate change and increase pro-environmental awareness, engagement and behaviour change around the issues.

Effect of Exclusionary Provisions of the Federal Lands Provisions under the Impact Assessment Act on Economic Development on First Nations' Reserves (April 2021)

Author: Julie Wood

Employer: Indigenous Services Canada

Abstract

First Nations peoples living on reserve face numerous barriers to pursuing economic development opportunities on their lands. The complex jurisdictional management of reserve lands under the Indian Act has led to First Nations being disproportionately impacted by federal legislation when pursuing economic activities. The Federal Lands Provisions under the Impact Assessment Act (impose obligations on federal departments to complete environmental assessments (for projects they enable on federal lands including reserves. The IAA introduced the Exclusion List, a statutory tool which allows for the exclusion of pre-defined, low risk projects from EA. The objective of this report is to determine whether the Exclusion List could be used as a tool that could reduce the administrative burden imposed on First Nations when pursuing projects on their lands. To accomplish this, the report analyses 18 consultation reports submitted by Indigenous groups during consultations held for the development of the Exclusion List. Four main themes emerge from this analysis: (consultations on the development of the Exclusion List were inadequate; the Exclusion List fails to consider Indigenous rights; (excluded projects could result in unaddressed cumulative effects and (excluded projects could adversely impact unidentified cultural resources. The report finds that the themes that emerged during consultations are not represented in the final version of the Exclusion List. It concludes that due to outstanding issues related to the Indian reserve, Act land regime and inadequate environmental regulations on that the Exclusion List is more likely to reduce the burden on federal practitioners who conduct EAs than for proponents of projects on reserve.

The Sectoral Approach to CO2 Mitigation: A Cement Industry Case Study (April 2021)

Author: Benjamin Kline

Employer: John Kline Consulting, LLC

Abstract

The cement industry has reported significant reductions in specific CO2 emissions since 1990. The industry formed its own industrial group focused on improving sustainability. This group worked with the International Energy Agency to develop a specific cement industry sector approach to reducing CO2 emissions. This report explores the essential elements of a sectoral approach and their potential for improving environmental performance. A sectoral approach consists of a combination of targets and measures, developed to enhance efficient, sector-bysector, GHG mitigation. The progress made in reducing specific CO2 emissions in the cement industry was evaluated against the five main elements of the sectoral approach as defined by the literature. These elements include; (1) collecting data for establishing baselines, developing targets, defining performance indicators, and tracking progress, (2) disseminating best practices and technology, (3) encouraging participation, (4) addressing competitiveness concerns, and (5) building global commitments. As seen with the Cement Industry, sectoral approaches can make a significant impact on industries that are willing to put in the required effort. They establish baselines, targets, and drivers for CO2 emission reductions. While they do not lead directly to the formation of binding commitments, they can provide a foundation for doing so. One major advantage of sectoral approaches is their ability to provide sector specific benchmarking and the diffusion of best practices. SAs are voluntary and can draw in participants from jurisdictions that do not have formalized GHG reduction programs. However, as the program is voluntary there is no enforcement behind it.

Impact Assessment in Canada's North: A Co-managed Approach toward Self Determination? (May 2021)

Author: Lorena Gracia Zayas

Employer: Crown Indigenous Relations and Northern Affairs Canada, Environmental Assessment, Land Use Planning and Conservation Division

Abstract

Above the 60th parallel and comprising forty percent of the land, Canada s north has a different approach towards resource development than the rest of the country. The approach is based on co management with Indigenous Peoples and modern treaties, which contributed to implementing separate impact assessment (processes in each territory. This report analyses the northern co managed approach, emphasizing settled and unsettled regions (i. areas with resolved or unresolved land claims through negotiations and environmental governance, by posing two research questions regarding the differences between northern legislation in each region and the approach's influence on the IA processes and Indigenous self determination. Through the study of three northern regions reinforced by a literature review of comprehensive land claim agreements (CLCAs) self government agreements (land us e planning (and IA regimes the report reveal s four major findings. 1) The northern co management legislation provides better Indigenous participation than its southern counterpart 2) The re are four fundamental variations between northern legislation in settled and unsettled regions fractioned opportunity landscape, capacity, implementation, and governance structure. 3) There is an intricate relation ship between CLCAs and the northern IA processes, as the former establishes the assessment's requirements and decision making authorities. 4) CLCAs promoted the establishment of LUPs and SGAs which are Indigenous self determination tools. The report concludes that the northern co managed approach is a step toward self determination and suggests that supporting Indigenous groups to attain SGAs including a solid LUP would create an equal partnership between Indigenous Peoples and the Canadian government.

The Effects of Canadian SEA on Project-level EA Processes and Life-cycle Regulation: A Perspective on Canadian SEA through Intervenor Participation in a Canadian Nuclear Safety Commission Public Hearing (September 2021)

Author: Douglas Zannis Wylie

Employer: Canadian Nuclear Safety Commission

Abstract

A loss of trust in environmental assessment (EA) processes has become a common issue stemming from a disconnect between the widespread practice of project-level assessment and stakeholder expectations surrounding sustainability. It has become clear that project-level assessments are not suited to address policy-level decisions, but in practice higher-level assessment systems, referred to as strategic environmental assessment (SEA), have not enjoyed as much success in terms of refinement or adoption. Without a greater focus on multi-tiered EA systems, project-level assessments will continue to face a crisis of efficacy.

This paper will provide an overview of Canadian EA, its development and intention to understand its shortcomings when dealing with topics beyond the project-level. The question that this paper attempts to answer is if there has been an over reliance on project-level assessment and a lack of SEA in the Canadian EA framework and how has this impacted regulatory practices, specifically for the nuclear lifecycle regulator and industry. The case study of the 2018 licence renewal for the Pickering Nuclear Generating Station presented later in the paper will help to demonstrate the issues facing the lifecycle regulator and an appetite for more SEA by reviewing topics raised in interventions presented to the Commission.

An Analysis on the Disclosure and Communication of Uncertainty in EA: A Case Study of the Nunavut Planning and Project Assessment Act (September 2021)

Author: Antoni Di Done

Employer: Crown Indigenous Relations and Northern Affairs Canada

Abstract

The environmental assessment (EA) process is regarded with a high degree of uncertainty, however history has shown that the communication of uncertainty in EA reports have been largely absent despite decades of research suggesting its importance in the consideration for follow-up. This has led to the proposal of environmental protection plans and contingency measures that are less efficient than anticipated. This paper provides an overview on the relationship of followup and uncertainty, classifications that exist for articulating uncertainties, and historical trends on how uncertainties are communicated in Canadian EAs. The question that this paper attempts to answer is to what extent uncertainties are communicated in EAs. To accomplish this, the study conducted a comprehensive review of an environmental impact statement - the Nunavut Planning and Project Assessment Act (NuPPAA) (2013) - with a focus on its environmental protection plans and follow-up programs. Review questions were used to extract uncertainty disclosures to evaluate how explicit the proponent was in their communication of uncertainties. The results showed that there were few discussions about uncertainties, and when they were discussed, they were usually brief and general in their descriptions. Additionally, the proponent frequently interchanged words to describe uncertainties making it difficult to grasp the confidence of their predictions. Therefore, the largely absent discussion of uncertainties coupled with the inconsistency of its communication suggests that there remains a need for legal provisions that require developers to disclose uncertainties as well as guidelines on how to best communicate them.

An Assessment of the Efficacy of Unmanned Aerial Vehicles and Remote Sensing Technology to Support the Development of Indigenous Forestry Management Plans (September 2021)

Author: Adrienne Murphy

Employer: Hummingbird Drones Inc

Abstract

Indigenous land use planning is the process by which a community determines the collective vision and goals for the future of the lands and resources. It is a tool to communicate with industry, protect traditional and cultural ways of life, assert rights and title, and manage conflict. This report assesses the efficacy of using drones and remote sensing technology to support the development of Indigenous land use plans (LUPs) in British Columbia, with a focus on forestry management. The literature review is broken into two sections. The first section presents a background on conventional land use planning in British Columbia, and on the forest management plans (FMPs) that exist within it. The limitations of conventional land use planning are explored with the assumption that they may be applied to the FMP process. This is followed by an introduction to Indigenous land use planning, challenges associated with the process, and the emergence of Indigenous LUP resources available. The second section presents a review of the various drone types and remote sensor options available, and the associated monitoring techniques for forestry practices. These sections are presented together to provide context for the case study, which conducts a strengths and weaknesses analysis associated with the use of drones and remote sensing technology to assist Indigenous communities in developing FMPs. Forestry indicators for Indigenous FMPs have been identified by Spies et al. (2019) and are compared against the applications for drone use in the forestry sector, as outlined in the literature review. The results find that drone technology offers benefits for collecting quantitative forestry data, data governance, and providing opportunities for community engagement. Challenges include high investment costs and technical training. There are opportunities to expand to forestry research with the technology, however it must be implemented with due consideration of community needs and values, to prevent the perpetuation of settler-colonial knowledge management in the planning process.

Moving Epistemic Boundaries Community-Based Air Quality Monitoring & Environmental Justice for Strategic Environmental Assessment (September 2021)

Author: Hadrien Picq

Employer: Caravan Studios, a division of TechSoup Global

Abstract

Despite the decline of diesel particulate matter and regional fine particles in California since the introduction of state air toxic control laws in 1984, pollution hotspots persist throughout the state, predominantly in low-income and minority communities. Innovations at the intersection of air quality sensing and Information & Communication Technology over the past 30 years have granted non-experts new capabilities to monitor particle pollution in heterogeneously polluted spaces. Environmental justice advocates have seized this opportunity to organize communitybased monitoring (CBM) campaigns by deploying networks of low-cost air quality sensors, pushing the epistemic boundaries of regulatory monitoring. Assembly Bill 617 (AB 617) is a policybased Strategic Environmental Assessment (SEA) to coordinate the statewide reduction of air pollution among air quality management districts as an environmental justice issue, which includes allocating funds for historically marginalized and impacted communities to implement CBM. I investigated the Marie Harrison Air Monitoring Project, a CBM project under AB 617 in San Francisco's Bayview-Hunters Point neighbourhood, by interviewing five individuals involved in different capacities surrounding the project. The synthesis of the testimonies highlighted CBM as a strategy of the environmental justice movement to push the epistemic boundary of environmental monitoring by educating communities about environmental impact; providing an opportunity for regulators to answer uncertainties around environmental issues; and validating the lived experiences of local residents speaking-up about how their health is affected by environmental impact. The implication for SEA is that the public is actively seeking greater stakes in decision-making and in shaping the future of environmental monitoring policy.

Assessing Solastalgia and Indigenous Mental Well-Being in Canadian Environmental Assessment Processes (November 2021)

Author: Amanda Bulmer

Employer: The Firelight Group

Abstract

This report examines how the environmental assessments (EA) of major resource development projects in Canada reflect the solastalgia experienced by the Indigenous populations whose territories are being impacted by said projects. Solastalgia is the feeling of loss or distress experienced when the natural environment one calls home is undergoing transformation, disrupting the ability of this special place to provide cultural, spiritual, emotional, or social nourishment. The EA of the New Prosperity Gold-Copper Mine is used as a case study for determining whether Canadian EAs accurately reflect the mental health implications of solastalgia experienced by the neighbouring Tŝilhgot'in Nation (Tŝilhgot'in). With the help of the Environmental Distress Scale, the spoken words of the Tŝilhgot'in are analyzed for mentions of solastalgia using the hearing transcripts from the public hearings. These results are compared against the Review Panel's (Panel) Final Report to see whether the solastalgia and mental health impacts felt by the Tŝilhqot'in are accurately represented by the Panel in their decision. The results show that while there is clear indication of solastalgia in the hearing transcripts, this has not translated to the final decision of the Panel. Finally, this report concludes with a discussion on Indigenous-led ways to improve the assessment of solastalgia and Indigenous mental health in future EAs, including the suggestion of the development of individual community-based well-being assessment guidelines and/or protocols.

Does ISO 50001 Certification Contribute to the Corporate Fight against Climate Change? (December 2021)

Author: Vanessa Macri

Employer: Bell Canada

Abstract

In 2011, a set of energy management system standards called ISO 50001 was developed with hopes to curb corporate energy consumption. Many of the world's largest companies are now implementing this set of standards. However, ISO 50001 lacks any provision of specific energy performance measures, which makes it challenging to prove a direct connection between ISO 50001 implementation and an organization's energy performance. Using quarterly energy performance savings data pre- and post-ISO 50001 implementation from the North American telecommunications company, Bell Canada, descriptive statistics was used to suggest whether ISO 50001 implementation efforts affect a company's energy consumption and contribute to the fight against climate change. Three company divisions were considered, and their energy savings results pre- and post-ISO 50001 implementation were analyzed to suggest whether ISO 50001 implementation leads to increased energy savings. Based on this preliminary analysis, there appears to be no indication that ISO 50001 leads to improved energy savings. Once Bell receives and maintains ISO 50001 certification for several years, a larger data set will enable stronger statistical analyses to overcome the limitations identified in this study.

What can Readability Tell Us? An Inquiry into Text Analytics for Improving Communication in Impact Assessment (December 2021)

Author: Whitney Light

Employer: Parks Canada

Abstract

Clear, open communication is essential in impact assessment (IA) processes. It enables the public and stakeholders to develop trust in the process, understand impacts, and come to opinions or decisions. Given the importance of communication to IA, this report inquires into the quality of written IA documents, how it can be measured, and what can be done to improve it. It does sousing a simple example of text analysis to test document quality while investigating the limitations and possibilities of the analysis for IA more broadly. Specifically, readability formulas which employ countable features of prose to indicate comprehensibility, as opposed to holistic "readableness"— are applied to project descriptions posted to the Canadian Impact Assessment Registry (CIAR) by Parks Canada Agency (PCA) and two other federal agencies, Indigenous Services Canada and Fisheries and Oceans Canada. Acknowledging the limitations of readability as a measure of document quality, other analyses are explored. An attempt is made to quantify the degree to which these initial project descriptions posted to the registry accurately describe the projects, by comparison with final project descriptions prepared for internally read reports. Whether the texts are accurate is unclear. The readability results, however, show that registry texts are very difficult to read, probably too difficult to serve the intended public purpose. These findings are accompanied by a discussion of the limitations of the techniques applied, but also their untapped potential for IA, particularly in light of readability research innovations in other disciplines with similarly heavy document loads and democratic objectives. Practical recommendations are made for agencies preparing CIAR texts, as are suggestions for future research. A key recommendation is that public-facing texts be written by professional writers and periodically reviewed by users, i.e., members of the public.

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Exploring the Added Value of an Ecosystem Services Approach to Strategic Environmental Assessment in the European Water Policy Context (March 2020)

Author: Thomas Turoczi

Employer: ArchEnerg Cluster / SolarTech Kft.

Abstract

This paper considers the added value of using ecosystem services in strategic decision making in the European water policy context, i.e., implementing the Water Framework Directive (WFD). It tests the notion that ecosystem services can be utilized in strategic environmental assessment (SEA) to promote more sustainable water resource management while avoiding trade-offs. This is particularly important, as European Union (EU) member states are tasked with both improving water environments and implementing better flood risk measures (which traditionally has implied constraining watercourses) and for such high-level planning to encompass an environmental assessment of strategic nature. The paper investigates the effectiveness of using ecosystem services in the SEA process of water resources and flood risk planning in the UK, in regard to the avoidance of trade-offs and the facilitation of more synergistic solutions. Six SEA reports were chosen as case studies from three regions, the Anglian, South West, and Thames watersheds. This study considered each region's river basin management and flood risk management SEA report. The synthesis of positive and negative effects of each plan's measures on various ecosystem services helped conceptualize planning priorities and the identification of more synergistic solutions. A matrix table was constructed with numerical values to highlight the actual relationships between ecosystem services within reports, with higher numbers indicating more synergies, lower numbers more trade-offs. The findings indicated that there were more trade-offs to deal with in flood risk planning than river basin management. Much of the synergies noted were measures at catchment scales, working closely with farmers, initiating nature-based solutions by river trusts and water companies. The opportunities identified, point to evidence there is a costbenefit for working with ecosystem services. Takeaways were the following: while conceptualizing the importance of ecosystem functions through an evidence base can facilitate more support for nature-based solutions - that is, green infrastructure programs - an ecosystem services approach in general can provide a holistic lens to strategic impact assessment (encompassing socioeconomic considerations as well as environmental ones) and subsequently facilitate more meaningful stakeholder engagement. This could aid strategic environmental assessment in promoting sustainable solutions while attaining WFD and flood risk management targets through a more integrated approach and nationwide consistency in monitoring.

Assessing Shifting Environmental Baselines in Environmental Assessment Using Aerial Photography and Satellite Imagery (March 2020)

Author: Gabriel Morrissette

Employer: Enviro Vidéographic

Abstract

Conducting accurate environmental baseline studies is crucial in producing meaningful environmental assessments. The shifting baseline syndrome, a term first coined by marinebiologist Daniel Pauly in 1995, occurs when current conditions are used as the baseline rather than evaluating them based on past conditions. In doing so, we run the risk of accepting a degraded state as normal or even as an improvement. The aim of this report is to show how historical aerial photographs and satellite images can be used to help prevent the establishment of erroneous baselines in the context of environmental assessments. Two different examples of cases in which historical aerial photographs were adequately utilized will be discussed. In addition, the case study of the Pionniers interchange project in Terrebonne, Quebec is presented in detail as an example of the potential environmental, social and economic consequences associated with the use of inaccurate baselines. As pressure from urban development continues to mount on natural areas, it is increasingly important to ensure environmental management decisions are made based on the best available data. Although aerial photograph and satellite imagery interpretation is not a perfect science, this report concludes that as a valuable source of information, it should become an integral part of environmental assessments, as is currently the case in environmental site assessments.

Avoidance of "Box-Checking" in Environmental Assessment: The Haida Nation as a Case Study to Improve Indigenous Consultation and Accommodation

(March 2020)

Author: Andy Clarke

Employer: Canadian Environmental Assessment Agency (Indigenous Consultation Division)

Abstract

The Government of Canada has committed itself to pursuing reconciliation with Indigenous people in Canada. These reconciliation efforts are playing out amidst a backdrop of high-profile court cases where major proposed development projects have been accused of (and halted because of) inadequate Indigenous consultation during the environmental assessment process. The present scenario begs the question of how Indigenous consultation in Canada's environmental assessment process can be improved and avoid the fatal pitfall of meaningless consultation known as "box-checking" (a common complaint put forward by many Indigenous groups in Canada). To determine an answer to this question, this paper first analyzes Canada's current environmental assessment legislation and the Haida Nation 2004 court ruling that helped establish and clarify the Crown's legal duty to consult impacted Indigenous people. Following this, the unique relationship between the Haida Nation and the Crown is examined and discussed to help identify factors that could help improve the legitimacy and meaningfulness of Indigenous consultation and accommodation efforts. The high bench mark set for the Crown in its consultation/accommodation duties for the Haida people (due to a lack of treaties and a high strength of claim to title over their traditional territory of Haida Gwaii) makes this case study ideal to gain insights about improving consultation efforts nationwide. The co-management agreements between the Haida and the Crown are examined, as is the concept of co-management and cojurisdiction in general. The paper concludes that moving towards a proportional sliding scale of co-management agreements could help improve and lend legitimacy/meaningfulness to Indigenous consultation/accommodation efforts in Canada's environmental assessment process, therefore avoiding the pitfall of "box-checking."

Gender and Diversity Analysis for Natural Resource Projects: Drawing Inspiration from Indigenous-led Impact Assessments in Northern Canada (March 2020)

Author: Joanna Griffin

Employer: Environment and Climate Change Canada

Abstract

The 2019 Impact Assessment Act supports inclusivity, acknowledging the significance of diversity factors in dictating how individuals experience development projects and increasing recognition of alternative impact assessment (IA) models, including Indigenous-led IA (Government of Canada 2019). This paper addresses the consideration of gender and other diversity factors in Canadian IA, particularly as it relates to impacts on Indigenous women. It explores how best principles for gender-based analysis plus (GBA+) are applied in two types of Indigenous-led IAs: co-managed (Crown and Indigenous group as partners) and co-developed (proponent and Indigenous group as partners), which shadow the federal process within the context of local land claims and self-government agreements. Drawing from IA practitioner and academic literature, four best principles for GBA+ were selected: respect, transparency, contextual understanding, and inclusivity. IA documents were examined for application of these best principles and features of the IA styles that help or hinder implementation of GBA+. Results indicate that both IAs used diverse approaches to incorporate GBA+ best principles, but that attention needs to be paid to transparency. The main strength of the co-managed IA was found to be the legal requirement for joint decision-making, while the co-developed IA profited from a particularly close proponent Indigenous group relationship, as well as Indigenous involvement early in the IA process. To better integrate GBA+ into IA, it is recommended that proponents foster close, collaborative relationships with Indigenous groups, involve Indigenous Peoples (particularly women) early in the process, and build in requirements for retrospective IA to enable adaptive management.

Regional Assessment: A Tool to Establish Baselines for Cumulative Effects Assessment (April 2020)

Author: Victoria Guba

Employer: Impact Assessment Agency of Canada

Abstract

The shifting baseline syndrome has been a notable challenge in Canadian environmental assessment. Practitioners conducting cumulative effects assessment as a part of project-level environmental assessment often accept current conditions as baseline, consequently dismissing critical thresholds and underestimating impacts of their projects. It is the purpose of this paper to investigate regional assessment, as set out under the 2019 Impact Assessment Act, as a tool to inform the establishment of sufficient baselines for cumulative effects assessment. Three initiatives are evaluated as proxies of regional assessment under the Impact Assessment Act: (1) the Regional Assessment of Offshore Oil and Gas Exploratory Drilling East of Newfoundland and Labrador, (2) the Beaufort Regional Environmental Assessment, and (3) the Great Sand Hills Regional Environmental Study. Findings suggest regional assessment focused on information gathering and trend analysis may be well suited to establish baselines for cumulative effects assessment. Regional assessments focused on setting standard mitigation or evaluating alternative development scenarios may be more suitable in cases where baselines are relatively clear. Other characteristics, including partnerships with impacted communities and peoples with knowledge of the region, access to and integration of data, and capacity may be crucial to conducting regional assessments that can establish sufficient baselines.
The Importance of Following Environment, Health and Safety Regulations to Prevent Environmental Accidents: Study Case of Mariana - MG, Brazil

(April 2020)

Author: Juliana Carvalho Frota Mattos

Employer: Nimonik, Comprehensive Compliance

Abstract

This report is about the importance of following environmental, health and safety regulations in order to prevent environmental accidents from happening. The case study in this report is about the Fundão dam rupture that occurred on November 5, 2015 in the municipality of Mariana -MG, Brazil. This dam was operating in critical conditions since it was overflowing with tailings from the mine. The rupture caused a devastating destruction of the environment, killing domestic and farm animals, wildlife, plants and people from the communities of Mariana as well as chemically contaminating the environment. This report provides an evaluation of the legislation requirements that were in non-compliance by the company Samarco. This work was done by evaluating the Brazilian environmental health and safety as well as occupational health and safety legislation in order to answer audit questions that are used for compliance obligations. The evidence provided in the report is from an analysis of the Federal Public Ministry of Minas Gerais, Brazil of the Fundão dam rupture. The lessons learned from this report is that the Brazilian environmental legislation provides strong requirements for the protection of the environment and safety for the workers and population. However, stronger and better enforcement of the rules and regulations need to be made by the government in order for companies to comply with the legislation. Furthermore, better safety procedures and practices need to be given to the workers and to the community that inhabit the neighbouring areas of mining industries.

Gender-Based Analysis + in Environmental Assessments: Leaving Something to be Desired? (June 2020)

Author: Stephanie O'Connell

Employer: Impact Assessment Agency of Canada

Abstract

The challenges associated with integrating the human environment in Environmental Assessment (EA) in Canada is linked to the inherent complexities of understanding social dimensions. Gender-Based Analysis + (GBA+) is a tool used in EA to better understand and inform decision-makers about potential disproportionate effects of a project, including social impacts. Greater complexities arise when GBA+ is applied to engagement with Indigenous peoples in Canada when the EA consultation process is faced with its own challenges and barriers. This report focuses on 'How?' and 'Why?' GBA+ became an important feature to the newly enacted Impact Assessment Act (IAA) through the use of examples where attempts to do good GBA+ actually fell short. Anticipating challenges in applying GBA+ requires an understanding of barriers to consultation with Indigenous peoples. The Stk'emlúpsemc te Secwépemc Nation-led EA demonstrates a greater understanding of the potential for differential impacts through the involvement and inclusion of diverse voices in their review process that proved to be lacking in the joint provincial and federal EA for the Ajax Mine Project. Lastly, certain key components to the IAA allow the opportunity for GBA+ to be better realized by (a) a broader scope of factors to be considered (b) the use of complementary measures and (c) honouring Canada's commitment to reconciliation with Indigenous peoples in Canada.

Integrating Life Cycle Assessment in China's Sustainable Development: A Case Study of the Cashmere Industry (June 2020)

Author: Xiaolan Sun

Employer: Ningxia Clean Development Mechanism (CDM) Service Center

Abstract

Life Cycle Assessment (LCA) is an environmental management tool that supports decision making on environmental sustainability. Wide-scale application of LCA in China has only occurred after the government included LCA in its strategic sustainable development plan. The Green Manufacturing System Integration Project (Cashmere Product) was approved by the Chinese Central Government in 2017, and undertaken by the Rongchang Group, one of the top ten cashmere manufacturers in China. Using this project as a case study, I examine two questions: 1) What is LCA's current role in the cashmere industry in China? and 2) How can China learn from the case of LCA of cashmere to better integrate LCA into its sustainable development? I use the LCA report completed by the project team and my internship experience with this project to analyze the challenges and issues related to database development, data collection, impact assessment, and the formulation of LCA related public policies in China. I also compare this case with successful experiences in the European Union. Although the LCA is a key technology to achieve the goal of green manufacturing, I found out that decision makers in government and the cashmere industry treat the LCA as a process, not an important tool in the Green Manufacturing System Integration Project (Cashmere Product). I conclude that China needs to establish a mature and universal LCA inventory database, and set up an independent joint research institution to provide scientific and technical support and guidance to the development and application of LCA in China.

Addressing public concerns for nuclear waste through meaningful public participation. A case study of the Near Surface Disposal Facility Project

(June 2020)

Author: Erin Brown

Employer: Canadian Nuclear Laboratories

Abstract

Public concerns towards the nuclear industry have made siting nuclear waste disposal facilities particularly challenging, which can make it difficult to safely dispose of radioactive waste from decommissioning and legacy activities. However, lessons learned from other nuclear waste disposal projects indicate that meaningful public participation in environmental assessments (EA) can be used to help address public concerns and achieve project approval. For meaningful public participation to occur, researchers have found that proponents must involve the public early on, respect different views and engage in two-way communication. Firstly, early involvement includes providing stakeholders with timely and straightforward access to information, up-front participatory funding and an establishment of an initial communication plan. Secondly, respecting different views involves identifying subgroups amongst stakeholders, and identifying and addressing each subgroup's concern. Thirdly, for two-way communication to be achieved the proponent must demonstrate the incorporation of suggested mitigation measures and openness to unforeseen events. Here, I evaluate Canada's Near Surface Disposal Facility (NSDF) Project, for the management of low-level radioactive waste (LLW), against the three established criteria for meaningful public participation. My findings suggest that the NSDF Project did not involve the public early-on, has not completely respected different views and has not been engaging in twoway communication. This evaluation of the NSDF Project suggests that the Proponent is at risk of failing to address public concerns through meaningful public participation. Going forward, the Proponent should make concerted efforts to engage all subgroups and ensure early involvement in future projects.

Replicative Analysis of Canadian Environmental Sustainability Indicators Water Quality Report (September 2020)

Author: Eva Charbonneau-Bérubé

Employer: Water Quality Monitoring and Surveillance Division, Environment and Climate Change Canada

Abstract

Collection and analysis of data are cornerstones of scientific and engineering projects such as environmental impact assessments. All too often, however, replication of such analyses is sidelined, despite replicability being a core component of the scientific method.

This paper seeks to ensure the replicability of the results obtained in the 2019 Canadian Environmental Sustainability Indicators: Water Quality in Canadian rivers report and to increase availability to water quality data from across the country. To this effect, data from 913 water collection stations across Canada, collected from the years 2002 to 2017, was subjected to the same Water Quality Index and Mann-Kendall trend analysis methodology as found in the report. The null hypothesis is that the report's findings were successfully replicated at an α of 0.05 using Fisher's Exact Test, whereas the alternate hypothesis is that it could not be successfully replicated. While replicated Water Quality Index values were found to be strongly associated with the reported literature values across both regional and national scales, Guideline Deviation Ratio trend values were not found to be strongly associated with literature values ($p \le 0.05$). Such results suggest a methodological misstep, variance in the dataset or water quality guidelines that were not reported in publicly available datasets. As replication of Guideline Deviation Ratio trends was not possible, caution should be employed when using older data towards studies or assessments, and access to legacy measurements and guidelines should be facilitated.

The Use of Geomatics in providing a Cross-sectional Coastal Ecosystems Map of the Estuary and the Gulf of the St-Lawrence in Quebec (September 2020)

Author: Maryne Drouet

Employer: Laboratoire de dynamique et de gestion intégrée des zones côtières (LDGIZC)

Abstract

Coastal ecosystems are located in the transitional zone between the land and the ocean. They hold important ecological, cultural, and economic values. But these ecosystems are threatened by anthropogenic activities and their consequences, e.g. numerous coastal infrastructures, increase in human population, sea-level rise due to anthropogenic impacts, climate change hazards, etc. In order to better preserve these ecosystems, and to find tools to adequately conserve them, the use of geomatics is needed to efficiently monitor the coastal environment. Thanks to innovations in geospatial technologies, experts are now able to push the acquisition and analysis of data further. This report aims to render a thorough description of the geomatics tools used to map coastal ecosystems in the estuary and the Gulf of the St-Lawrence at the Laboratoire de dynamique et de gestion intégrée des zones côtières (LDGIZC). At the LDGIZC, geomatics has enabled essential ecosystem information to be measured, mapped, and monitored. This report shows how the combined use of near-infrared images, oblique photographs, and field validation data has allowed to segment and characterize the territory, as well as provide a geodatabase with information used to assess erosion and submersion impacts. It clearly demonstrates that studies of coastal ecosystems in Quebec, and worldwide, should be one of the top priorities in research and public policy.

Could Academics Fly Less? Recommendations to Promote the "Flying Less Culture" at Concordia University (November 2020)

Author: Luz Angela Gomez Vallejo

Employer : Net Impact Montreal

Abstract

The aviation industry represents a significant source of greenhouse gas emissions in the world. To address this issue head-on, the 'flying less culture' is an essential initiative to fight Climate Change. Academics contribute to this issue, being one of the most intensive users of air travel. This report seeks to critically review the actions of seven universities in North America and Europe to reduce academics' air-travel emissions. The key questions addressed throughout this review are 1) What are the mechanisms implemented by universities to encourage the reduction of academic flying emissions? 2) How could these mechanisms serve as lessons for Concordia University to further engage in the reduction of its academic flying emissions? Five common approaches were found throughout the seven case studies, including 'Policy Intervention', 'Travel Decision Tools', 'Carbon Fee/Tax', 'Carbon Offsetting' and 'Incentives'. Based on these findings, a shift to a 'flying less culture' within educational institutions seems promising, yet important commitments from professors, departments and students are needed to attain this goal. The report concludes with a list of recommendations to effectively promote the 'flying less culture' at Concordia University.

A Critical Analysis of the Modernized Environment Quality Act: Is Québec moving Forward? (December 2020)

Author: Jessica Babikian

Employer: The Green Coalition/La Coalition Verte (GCV)

Abstract

Inadequate Environmental Impact Assessments (EIAs) and improper issuance of environmental authorizations constitute a serious threat to natural spaces and biodiversity, presenting a pressing problem for the future of our planet and humanity. The Environment Quality Act (EQA or the Act), Quebec's main environmental protection legislation, has undergone some major \ reforms since its enactment in 1972, particularly with the adoption of Bill 102 in 2017 to modernize the EQA. Despite amendments introduced in light of the modernization of the Act, it seems that there are still some aspects that need to be improved to ensure that Québec's regulations and policies live up to the goals and targets it aims to achieve locally and globally. The present report focuses on the Southern context of Quebec's EQA and some associated regulations to determine whether the modernized EQA represents a move forward in the direction of prioritizing environmental protection and biodiversity conservation. To this end, key amendments related to various aspects including ministerial authorization, EIAs, wetlands and bodies of water and climate change considerations are presented and critically addressed, shedding light on the persisting shortcomings of the Act. The Éco-campus Hubert Reeves Project is used to highlight the main challenges of the Act prior to modernization. An attempt to simulate the possible scenario(s) that might have prevailed had the Project been subjected to the modernized EQA allows to determine the aspects that should be further improved. Findings of the present report point to the urgent need of transformative change that prioritizes the protection and conservation of the environment over economic growth.

Consideration of Ecological Connectivity in Canadian Environmental Impact Assessment: A Critical Review of Current Practice (December 2020)

Author: Charla Patterson

Employer: University of Dar es Salaam at The College of Agricultural Sciences and Fisheries Technology

Abstract

In Canada, ecological connectivity is not part of Canadian environmental impact assessment (EIA) legislation. This project seeks to understand to what extent connectivity has been considered in EIA in the absence of explicit policy, identify performance gaps, and provide recommendations to inform future EIA policy. For this study, an exploratory analysis of potential factors influencing the consideration of connectivity in the EIA process was undertaken by assessing 14 EIS documents obtained from the Canadian Impact Assessment Registry using a series of review questions. Factors that were considered included: federal environmental acts (CEAA 1992, CEAA 2012), development sectors, proponents (Crown corporations compared to the private sector), whether connectivity was selected as a valued component, and different sections of the EIS. The assessment of connectivity was not affected by different federal environmental acts, development sectors, or proponent types. Projects that included connectivity as a valued component performed better in their evaluation of connectivity overall in the EIA process. Between sections of the EIS, a significantly greater number of assessment criteria were met for the scoping phase compared to all other sections. Ultimately, connectivity is largely absent from the EIA process, and even projects that attempt to include connectivity in their assessment lacked the rigor required to effectively characterize connectivity or assess project impacts. Ecological connectivity should be included in EIA legislation - doing so would provide a legal framework to address issues pertaining to the lack of policies, standards, guidelines, definitions, and thresholds for analysis.

Upgrading Municipality Streetlight Networks Using a Cloud-based GIS System (December 2020)

Author: Elizabeth Duong

Employer: RealTerm Energy

Abstract

Public lighting is a significant contributor to a city's energy use and cost. In the past couple of decades, many cities across Asia, Europe as well as North and South America have initiated the retrofit of their public lighting to improve energy efficiency and reduce their carbon footprint. Light emitting diode (LED) technology has been the dominant choice to replace conventional lamps because it provides more energy savings and better quality of light. When a municipality initiates the conversion of its streetlights to LED, it first needs to have a detailed and accurate inventory of its existing assets; this dataset serves as the baseline for the project. Like baseline studies in environmental impact assessments (EIA), the streetlight inventory forms the foundation for subsequent project phases. The inventory is generally built from collected field data and recorded in a geographic information system (GIS). GIS solutions are in fact commonly used throughout the lifetime of LED retrofit projects and these tools are usually part of a cloud-based GIS platform. The aim of this report is to examine how a cloud-based GIS system is leveraged in municipal streetlight upgrade projects and to explore how it can be beneficial or limiting to work processes. The case study in this paper provides an overview of Esri's cloud-based ArcGIS Online (AGOL) platform and outlines how its tools are used at different stages of a LED retrofit project. The methodology described may provide ideas or methods to collect environmental field data and to build GIS data visualization tools in the context of EIA. The results of this study reveal that the main benefits of using cloud GIS include access to real-time data and multi-user collaboration. Some challenges include cloud service latency and interruption, which can cause inefficiencies in work processes. The conclusion drawn from this report is that a cloud-based GIS system is efficient for data collection, data sharing and data visualization, which renders it the optimal solution for the completion of LED streetlight retrofit projects.

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The Consideration of Wildlife Road Mortality in Canadian Environmental Assessment Practice (January 2019)

Author: Mitra Pourali

Employer: Isfahan University of Technology

Abstract

Road network developments have always been linked with a loss of biodiversity worldwide. Environmental Impact Assessment (EIA) is applied as a legal framework with the potential to identify, predict, mitigate or compensate the negative effects of road projects on biodiversity. The objective of this report is to examine how effectively wildlife road mortality is considered in the Environmental Assessment process in Canada. First, six recent Environmental Impact Assessment reports (EIAs) of road projects in different provinces were selected. The second step was to create criteria and scores to analyze how EIAs assessed the impact of road mortality on wildlife based on methods used to assess wildlife road mortality, road mortality magnitude, affected species, spatial and temporal patterns of road mortality, patterns of wildlife movement & distribution, and the proposition of mitigation measures. The results showed weak to moderate consideration of wildlife road mortality in EIAs in total, which means there is a strong need for improvement concerning the consideration of wildlife road mortality in Canadian EA. Results also demonstrated that proposition of mitigation measures, patterns of wildlife movement and distribution, description of methods used to assess Wildlife Road Mortality (WRM), and WRM species ranked the highest in the projects assessed, while WRM magnitude and spatial and temporal patterns of road mortality scored the lowest. To address these deficiencies, recommendations are given for increasing the consideration of species at risk and other species in the Environmental Assessment process in Canada. Data collection in the field, quantitative estimates, spatial and temporal analyses, and habitat modelling or a combination of several techniques is recommended to be used to better assess road mortality in EIAs.

Recommendations to the Dairy Industry of the Environmentally Responsible Disposal Methods of Food Waste (*January 2019*)

Author: Anthony Fraschetti

Employer: Saputo's Global Head Office

Abstract

The food industry is within a contradiction between the need for a clean environment while also contributing to negative environmental impacts. One of the major contributors of environmental degradation is the dairy industry. Irresponsible disposal of dairy food waste has the potential to contribute towards climate change and water eutrophication. Dairy waste has a high concentration of biological oxygen demand (BOD) and chemical oxygen demand (COD). In addition there are two streams of dairy waste, solid dairy waste such as scrap cheese and dairy wastewater. The decomposition of organic matter with a high concentration of BOD and COD has the potential to release methane emissions and depleted oxygen levels in water. The most common means of disposal of solid waste is towards landfill and discharge to sewer for wastewater. Therefore this begs the questions as to the environmentally proper disposal of dairy food waste in comparison to landfill and direct discharge of wastewater disposal. Observing the six most common methods of food waste disposal: Landfill, direct discharge or untreated wastewater, aerobic biological decomposition, incineration, anaerobic decomposition, and land application; in relation to the selected environmental criteria of global warming potential and eutrophication potential and ranking them a lickert scale. The most optimal disposal methods to reduce environmental impact might be a combined method of anaerobic decomposition in conjunction with land application.

The Urgent Need for a Comprehensive U.S. Agro-Environmental Policy (January 2019)

Author: Eva Truyen Employer: Marble Valley Farm

Abstract

Current U.S. agro-environmental policy is focused on a voluntary incentive-based approach that has not proven effective long-term. This report examines available literature and presents a comparative analysis of two case studies on water quality as an agro-environmental issue: the Chesapeake Bay and the Mississippi River/Gulf of Mexico, with the goal of identifying strengths and weaknesses in federal agro-environmental policy as well as to make recommendations for improvement. Other reports have explored the political and social factors influencing this topic separately, yet an assessment of their combined impact is much needed. A strong coalition between the industrial agriculture sector and the United States Department of Agriculture (USDA) was identified as a major barrier to effective policy development. Additionally, political party interests and ineffective Farm Bill programs act as contributing factors. These observations, in conjunction with the case study comparison, informed the following recommendations: encourage the development of agro-environmental policy in state governments, redirect USDA funds to programs that emphasize whole-systems change, cut commodity subsidies and ineffective conservation programs, and institute a push-pull policy framework.

The Consideration of Climate Change Mitigation in Bill C-69 in Alignment with the Paris Agreement (January 2019)

Author: Elsa Westin

Employer: Les Serres Pierre Houle

Abstract

Currently, climate change is the most serious and complex global environmental issue. Global climate change commitments, such as the Paris Agreement, and greenhouse gas (GHG) reduction targets have emerged in ambitions of limiting the effects of climate change. Environmental assessment (EA) processes are developing approaches to address the issue of climate change and reach GHG reduction targets. The aim of this study is to examine the consideration of climate change mitigation in Canada's modified EA legislative proposal Bill C-69 and its alignment with the Paris Agreement, in order to determine if it can be considered a complementary tool to other Canadian action plans to reduce its total GHG emissions. An analysis of seventeen paragraphs from seven Article of the Paris Agreement, based on their feasibility and relevancy to the EA process in Canada in the context of climate change mitigation, were examined with Bill C-69. The examination revealed that Bill C-69 is insufficient in its alignment with the Paris Agreement in considering climate change mitigation and in assisting Canada in reducing its GHG emission. Furthermore, numerous definitions and terms linked to climate change mitigation were either ambiguous or absent in the legislative proposal. The examination of this case study did not reveal how climate change mitigation considerations in Bill C-69 will assist in meeting reduction targets and the Paris Agreement. However, implementing quantified thresholds for limiting GHG emissions might link the EA process to successfully meet GHG reduction targets. Future studies of appropriate EA actions and legislations are needed to reveal how consideration of climate change mitigation in the EA process may assist in meeting reduction targets.

Environmental Effects and Biodiversity under Canada's Environmental Assessment Regime (February 2019)

Author: Megan Stanley

Employer: Secretariat of the Convention on Biological Diversity

Abstract

The Convention on Biological Diversity (CBD) is an important commitment which Canada has made for safeguarding its biodiversity and ecosystems; and Environmental Assessment (EA) is a tool which can be used to aid in achieving national and international biodiversity objectives under the CBD. This procedure falls under the process outlined by the Canadian Environmental Assessment Act (CEAA), 2012. The objective is to assess designated projects triggered under CEAA, 2012 in Québec, where the Canadian Environmental Assessment Agency (the Agency) is the Responsible Authority (RA). Of the two provincial physical projects triggered federally, both are mines. Review of relevant literature and analysis of the Environmental and Social Impact Assessments (ESIA) and EA Reports are evaluated. The assessment criteria will consist of verification of the project's contributions toward the CBD's objectives of conservation, sustainable use and fair and the equitable sharing of benefits. Both projects show disruptions to the biological, physical and human environments, where special status, ecologically valuable and endangered/threatened species are present. Permanent loss and alterations of suitable terrestrial, wetland and aquatic environments will be affected by both projects' footprints. Notably, Woodland Caribou is a species of especial concern in both assessments. As such, the risks outweigh the benefits for both case studies regarding contribution and performance. The assessment of Valued Components (VC) took different trajectories in their presentation and assessment of environmental effects and biodiversity. Overall, Canada's contribution under current legislation has been less than admirable, however there is the potential for improvement moving forward.

Bring Back Canada's Federal Water Policy! A Comparative Assessment of Water Management in Canada and the EU (April 2019)

Author: Sarah Freemantle

Employer: Caisse de dépôt et placement du Québec

Abstract

Canada is a country blessed with an abundance of freshwater, however, in an era marked by unknown impacts of climate change, economic development and population growth, the lack of a comprehensive and holistic approach to the management of water at the federal level leaves Canada unprepared to protect this most precious resource. After a brief interest in implementing a federal water policy (FWP) in the 1980s, years of neglect are showing the weaknesses in federal water management. This paper argues that a strong federal water management framework implemented from the "bottom up" with a regional strategic environmental assessment (R-SEA) will help create an in-depth understanding of Canada's watersheds and better equip all levels of government to manage water in a more sustainable way. To better understand how water is typically managed, two natural resource management standards, Integrated Water Resource Management (IWRM) and Adaptive Management (AM) and one Environmental Assessment (EA) framework, R-SEA were examined and summarized. Two legislative water acts, the European Union's Water Framework Directive (WFD) and the Canada Water Act (CWA) were reviewed to gain a deeper understanding of the processes that govern federal water management in Europe and Canada. A list of best practices and principles from IWRM, AM and R-SEA was compiled and used to assess the two legal documents in terms of how they differed and to isolate potential lessons for strengthening water legislation in Canada. This report reveals that the addition of a federal water policy will strengthen Canadian federal water management and include measures to safeguard against climate change and other unpredictable water stresses and proposes implementing the policy with the use of R-SEA as seen in the WFD.

An Analysis of National Biodiversity Strategic Action Plans (April 2019)

Author: Michael Cortese

Employer: Secretariat of the Convention on Biological Diversity

Abstract

The primary objectives of a National Biodiversity Strategic Action Plan (NBSAP) are to develop national strategies for the conservation and sustainable use of nature and to integrate biological diversity into the plans, programmes, or policies of governing bodies. During my internship at the Secretariat of the Convention on Biological Diversity, I used NBSAPs to evaluate the status of biodiversity conservation for many countries and to forecast the progress towards the achievement of the Aichi Biodiversity Targets. Because NBSAPs are done at a national scale, there is an opportunity to use the information for a wider, regional assessment to uncover themes and discrepancies, and to evaluate the potential of the NBSAP as a conservation tool. In this report, I analyze the NBSAP of Parties in the Eastern-Afromontane Biodiversity Hotspot to provide a regional assessment of conservation initiatives. I then qualitatively evaluate each NBSAP using the ecosystem approach and provide a scorecard summarizing their success as conservation management plans. The purpose of my Internship Report is to fill an information gap associated with these specific foundational goals, and contribute to our understanding of the regional challenges associated with achieving them. The literature review describes the current biodiversity crisis currently underway. I then review the state and impacts of conservation efforts. The principle findings are that conservation efforts, especially protected areas, slow down biodiversity loss, but extinction rates are still substantially higher than the background rate.

Improving Agriculture in Connecticut with Strategic Environmental Assessment (April 2019)

Author: Christopher Ross

Employer: Riverbank Farm (Laura McKinney and David Blyn)

Abstract

The state of Connecticut's agriculture sector has been in steady decline since the mid twentieth century increasing the state's dependence on imported produce. As environmental issues have become a centerpiece of American political rhetoric, there has been an increased demand for produce grown locally and responsibly. In an effort to meet this demand, the Connecticut legislature created Grow Connecticut Farms, a strategic plan aimed to stimulate the local agricultural economy. Despite this effort, the plan has failed to make meaningful progress and achieve its goals. A literature review of both sustainable agricultural practices and strategic environmental assessment (SEA) within the context of Connecticut's agriculture industry and state regulatory framework serve as the foundation for this report. Two case studies in Rwanda and Canada demonstrate the successful implementation of SEA to agricultural initiatives in vastly different economic and geographic contexts. The findings of this report are intended to present a SEA framework based on best practices to the Grow Connecticut Farms initiative to encourage and incorporate sustainable development in agriculture. While the plan adequately addresses economic and social factors, it is lacking in environmental and sustainability principles that SEA could introduce. Successful implementation may depend on addressing institutional barriers such as insufficient funding, influence of special interest groups, and an incommunicative state government.

Implementation of Health Impact Assessment for Indigenous Peoples in Environmental Assessment (April 2019)

Author: Lisa Rosenberger

Employers: Department of Indigenous Services Canada

Abstract

Health Impact Assessment (HIA), is a valuable way to holistically analyze the effects of projects on health, however, it is used less often than environmental assessment (EA). Health evaluation is useful for indigenous peoples in Canada, who are more likely to be affected by large-scale development due to their isolation, dependence on the land and relative poverty compared to the Canadian average. The integration of health and environmental assessment can create a strong integrated assessment, which can help meet the health needs of indigenous peoples. In this report, I analyze whether the five steps of McCallum's et al. (2018) Assessment Framework are completed for eleven Canadian Environmental Assessment Act 2012 (CEAA 2012) EAs to determine if the principles of HIA are integrated into Canadian environmental assessment when considering the health of indigenous peoples. The results showed that most steps were not completed and that the assessments failed to consider the effect of the project on indigenous health in a systematic way in line with Health Impact Assessment principles. This indicates that there is a need to change the paradigm for how health is assessed in Canadian EA, in order to benefit indigenous peoples and increase the strength of assessment in Canada. Bill C-69 shows promising signs of improvements to health analysis.

Canada's Duty to Consult: Reviewing Canada's Aboriginal Consultation Process (June 2019)

Author: Shanara Eisan

Employer: The Canadian Environmental Assessment Agency

Abstract

The government of Canada has a duty to consult Aboriginal groups when projects or activities might adversely impact potential or established Aboriginal or Treaty rights. The following Supreme Court of Canada decisions have further affirmed and clarified this duty: Haida Nation v. British Columbia (2004); Taku River Tlingit First Nation v. British Columbia (2004); Mikisew Cree First Nation v. Canada (2005); and Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council (2010). While these decisions provide judicial clarification on the duty to consult, Aboriginal consultation processes (ACPs) remain an insufficient area in environmental assessment (EA). As a result of this deficiency, this report aims to provide insight on how to conduct adequate ACPs. This is done by using a case-based approach. First, Crown consultation processes are outlined, and bestpractice principles from the EA literature are identified. Following this, the aforementioned Supreme Court cases are reviewed as they provide context for the selected case study, the Grassy Mountain Coal Project, which is examined with the purpose of assessing the Canadian approach against best-practice principle. The analysis of this project elicits potential strengths, weaknesses and areas of improvement for ACPs. Based on federal consultation processes, a number of recommendations to improve ACPs in Canada are outlined. These include, early planning, funding, incorporation of ATK, consideration of colonialism, oral information gathering sessions and use of databases.

Considering Climate Change Under the New Canadian Impact Assessment Regime – A review of the Strategic Assessment of Climate Change (September 2019)

Author: Dominic McRae

Employer: Environment and Climate Change Canada

Abstract

This report investigates how climate change considerations, specifically concerning mitigation, can be integrated into the review of the impact assessment framework in Canada. This update is being done alongside a backdrop of various policies and commitments to manage climate change, with arguably the most important being the Paris Agreement targets of limiting global temperature rise to well below 2°C above pre-industrial levels, with efforts to limit the rise to 1.5°C. This paper highlights key features of an impact assessment regime that builds downwards from these highlevel targets to inform the treatment to inform the treatment of greenhouse gas (GHG) emissions mitigation and climate change in project-based assessments. The concepts of interest are establishing thresholds for cumulative effects assessment (CEA), assessing lifecycle emissions, carbon budgets, carbon pricing, and pathways to decarbonisation. These criteria are then applied to the Strategic Assessment of Climate Change (SACC), which will act as the Government of Canada's foundational guidance document for assessing climate change in impact assessments. The conclusion is that the SACC only partly addresses four of these five elements, disregarding carbon budgets altogether. Therefore, the SAC offers an incomplete framework for assessing climate change in impact assessment. The government should revise its development and implementation to include more rigid parameters for each of the criteria listed above. These should be based on best available scientific evidence and principles of social, economic, and environmental equality.

Equitable Governance: The Importance of Participatory Decision Making in Land-use Projects (September 2019)

Author: Megan Schmidt

Employer: Secretariat of the United Nations Convention on Biological Diversity

Abstract

Equitable governance helps projects succeed by allowing them to foresee potential risks, develop relationships with communities, and reduce chances of public opposition. The objective of this report is to identify factors necessary for projects to be governed equitably. This was done by conducting literature reviews of how equitable governance is discussed for Protected Areas and Environmental Impact Assessment. This literature review led to the identification of four participation frameworks: The Social License to Operate, the Duty to Consult, Impact and Benefit Agreements, and Free, Prior and Informed Consent. The main strengths and challenges of each of these frameworks are identified and discussed in this report. The case study then looks at the Edéhzhíe Protected Area, an Indigenous Protected and Conserved Area located in the Dehcho region of the Northwest Territories in Canada. This case study shows how the Government of Canada and an Indigenous community have successfully worked together to create, govern and manage a land-use project. Using the Edéhzhíe Protected Area as an example, along with the strengths and challenges of the four governance frameworks presented, it is recommended that participation be open to all stakeholders as early in the project planning as possible, to facilitate meaningful collaboration. It is also recommended that no single framework be used exclusively, but rather to allow the decision-making be adaptable to the stakeholders and project's needs to ensure that the project is governed equitably.

Stakeholder Engagement and Communication in Nuclear Waste Management: A Comparison of Canada and Sweden (September 2019)

Author: Jessica Way

Employer: Canadian Nuclear Safety Commission

Abstract

In environmental assessment (EA), public participation and stakeholder engagement have been extensively researched. The challenges are well understood. Communication methods, building public trust, social licence to operate, and risk assessment are all important considerations related to this topic. At the same time, discrepancies between public perception and evidence-based safety assessment are common in nuclear fuel waste management.

This report seeks to evaluate to what degree it is possible to bridge the gap between public perception and scientific evidence, through communication, public participation practices, and stakeholder engagement in EA for nuclear waste management projects. Also considered is the importance of timing and the stage at which public participation occurs; how public perception and risk perception influence project direction; as well as how social licence and public perception are factored into decision making processes.

Supported by frameworks produced by the Integration Group for the Safety Case and the International Risk Governance Council, best practices were elicited from the literature, and used to analyze the activities conducted in two case studies, the Nuclear Waste Management Organization Adaptive Phased Management Program and the Swedish Nuclear Fuel & Waste Management Company. In dealing with the influence of public perception, trust must be developed between the public and governments, regulators and proponents. This requires a unique strategy for every project, understanding local perceptions and existing knowledge of the local public. This can be combated through education and meaningful communication, which includes two-way dialogue and deliberation.

Choosing an Appropriate Environmental Impact Assessment Pathway: A Comparative Analysis of Parks Canada's and the National Park Service Screening Systems (November 2019)

Author: Alexandre Dussault

Employer: Parks Canada

Abstract

Screening plays a pivotal role in any environmental impact assessment system as it tries to conciliate the system's mandate of protecting the natural environment while using human and financial resources efficiently. Parks Canada Agency's (PCA) Continuous Improvement Program for Impact Assessment works toward ensuring that projects are screened appropriately. As a contribution to this program, this report compares a series of projects screened by PCA and its American counterpart, the National Park Service (NPS) to determine if these proposals would have been screened differently under the two systems. The report also explores the implications of the screening decision on the assessment a project undergoes in each respective jurisdiction. The report analyzes three pairs of case studies matched on project characteristic similarities and equivalent screening pathways. Despite several identified limitations in the matching process and in the general ambiguity of screening criteria, the analysis determined that all three PCA projects would most likely have been screened equivalently under the NPS jurisdiction, as would the NPS projects under PCA jurisdiction. In spite of the two screening systems' respective pathways demonstrating many similarities, the case study overview revealed that the level of analysis in the NPS assessments featured a greater level of detail than their PCA counterparts. As such, this report proposes that PCA seek International Joint Commission expertise to close the gap with the NPS in terms of inconsistencies in public consultations, disregard for cumulative effects assessments, lack of comparison of project alternatives and lack of transparency regarding the definition of impacts.

A Review of Biodiversity-Inclusive Impact Assessment in Canada (November 2019)

Author: Patrick Gannon

Employer: Secretariat of the Convention on Biological Diversity

Abstract

Biodiversity is declining globally, and this loss is among the pressing environmental challenges facing the planet in the 21st century. Environmental impact assessment (EIA) offers one possible means to address some of the drivers of biodiversity loss, yet research over the past 20 years has shown that biodiversity considerations within EIA are generally insufficient. This review addresses how well biodiversity is being incorporated into Canadian EIAs, assessing 14 projects conducted under the federal Canadian Environmental Assessment Act (CEAA) or its 2012 successor (CEAA2012). The 14 selected projects commenced between 2005 and 2014, covered most Canadian provinces, and included a range of project types (mining, roads, etc.). A biodiversity assessment index (BAI) is calculated to assess the information quality of environmental impact statements (EIS) with respect to biodiversity. Average BAI for the 14 projects was just below 0.5, indicating many deficiencies regarding the inclusion of biodiversity. There was no significant difference in BAI between projects conducted under the two Acts, and there was no significant difference in BAI between project types. Project footprint, EIS pagelength, and the page length of biodiversity-related chapters all had a significant positive effect on BAI. Some common problems in these 14 projects included not defining ecologically relevant study areas, poor consideration of alternatives with respect to biodiversity impacts, limited description of the methods for alternatives assessments, impact analysis, mitigation and monitoring, and a lack of information on the likely success of mitigation, among others. Recommendations for improvements regarding the inclusion of biodiversity in EIS include, inter alia, setting clear requirements regarding minimum survey efforts and the adoption of regional-EIA to improve the treatment of cumulative effects.

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The Role of Participatory Geomatics Technologies in Supporting Communitybased Food Gardening Initiatives in Northern Canadian Indigenous Communities (June 2018)

Author: Marion Macé

Employer: OHMI-Nunavik Niqilirinik Project: Northern Community Greenhouse Project

Abstract

As a consequence of accelerated environmental changes in the Canadian Arctic, exacerbated by rapid socio-cultural and economic transition, Inuit communities in Canada are facing a major food crisis along with a high level of food insecurity. Local food production initiatives have been developed as one alternative and culturally appropriate way of addressing this issue. Several projects in Northern Canada have shown great potential in providing opportunities for local, accessible, affordable and healthy food while contributing to communities' food autonomy and overall well-being. However, several issues with the development and management of these projects have been raised concerning the lack of local and long-term involvement, the lack of experience and technical expertise regarding food gardening and the lack of knowledge sharing support. As part of a community-based participatory project called Nigilirinik (meaning "taking care of food" in Inuktitut), in two Inuit communities in Nunavik, my research focused on the role of participatory geomatics technologies in contributing to the development and management of local food gardening initiatives that address food insecurity in Northern Canadian Indigenous communities. This report seeks to develop a critical understanding of the possibilities and limitations associated with participatory digital mapping tools. The results show that participatory geomatics has significant potential for increasing local, and more specifically youth, involvement in the development of a community-based monitoring system, and for creating knowledge sharing platforms. However, several challenges still need to be addressed such as limited access to a reliable internet connection and the need for long-term support and implementation.

Marine Mammals in Environmental Assessment in Canada (June 2018)

Author: Sophia Maglieri Employer: Transport Canada

Abstract

Many marine mammal species, including whales, seals, sea lions and sea otters, are at risk in Canada. Threats currently impacting these animals include underwater noise, vessel strikes, contamination of habitat and reduction in prey availability. These threats can be caused or exacerbated by development projects, currently regulated by Environmental Assessment legislation in Canada. The objective of this report is to identify legislation protecting marine mammals, threats to marine mammals, and to explore how marine mammals are considered in the Environmental Assessment procedure in Canada. First, threats were collated from the Species at Risk Public Registry. Criteria were developed to evaluate performance of the projects, based on: scoping, impact prediction, impact management, monitoring and follow-up, uncertainty disclosure and cumulative impacts. Eight designated project Environmental Impact Statements were selected for evaluation. It was found that the Environmental Assessment process partly complies with existing legislation protecting species at risk in Canada. In the projects assessed, impact management and scoping are scored highest based on criteria, while uncertainty disclosure, baseline, risk of vessel strikes, monitoring and follow-up and cumulative impacts of marine traffic scored the lowest. To address these issues, recommendations were given for these five poorly ranked areas. General recommendations were also given for increasing consideration of species at risk in the Environmental Assessment process in Canada. In conclusion, it is recommended that an increase in coordination between species at risk legislation and EA processes occur, so that these can cooperatively improve the state of marine mammals and other species at risk in Canada.

The consideration of Landscape Fragmentation and Connectivity in Canadian Environmental Assessment Practice (April 2018)

Author: Felipe Casasanta Mostaço

Employer: Ville de Montréal

Abstract

The preservation of landscape connectivity has become increasingly important for achieving biodiversity conservation goals globally. In Canada, some national and regional initiatives have been developed with this purpose. These efforts imply the need for incorporating this approach in EA regulations, as large projects are capable of creating fragmented landscapes. An analysis of the consideration of landscape connectivity and fragmentation in Canadian EA was conducted through a systematic review of ten recent Environmental Impact Statements (EISs) of projects in several development sectors. The focus was on assessing the importance given to this issue through the selection of valued ecosystem components (VECs), impact prediction and the elaboration of mitigation measures and monitoring plans. Overall, VECs are limited to the assessment of vegetation loss and alteration of the amount and quality of wildlife habitats, which do not necessarily reflect changes in landscape connectivity. Although commonly employed methodologies seem to be efficient for assessing landscape fragmentation, improvements regarding the measurement of wildlife movement and landscape connectivity conditions are necessary in order to predict impacts more properly. Presently, mitigation measures and monitoring plans do not include the creation of biological corridors, opposing to trends in conservation planning that are supported by current scientific literature. As a conclusion, it is recommended that Canadian EA legislation shift to a more inclusive approach that would effectively incorporate the assessment of impacts on landscape connectivity as a requirement for every project undergoing an EA. Better assessments will result in robust mitigation measures and inclusive long-term monitoring plans, contributing to maintaining landscape connectivity and biodiversity in Canada.

Geospatial technologies applied to the Environmental Impact Assessment of Agriculture (April 2018)

Author: Gurpreet Kaur Employer: Dr. Angela Kross Research Lab

Abstract

Agricultural practices such as improper water management, use of fertilizers and pesticides, clearing of forests negatively impact the environment. Despite these impacts, no federal or regional framework exists in Canada to regulate or assess the environmental impacts due to agricultural activities. Environmental Impact Assessments (EIA) are normally applied to new developments and the nature of agriculture developments may have complicated the regulation of this sector. This study investigated other impact assessment frameworks and discusses the use of the Life Cycle Assessment (LCA) as a suitable framework for the assessment of historic and long-term impacts associated with the production of a crop. This report further discusses environmental indicators that can be used within the assessment frameworks and the usefulness of spatial technologies in assessing the impacts associated with different agricultural practices. A case study serves as an example of how geospatial technologies can be used within an EIA framework applied to new agriculture developments or agricultural practices, such as tile drainage systems, within existing agriculture fields. Crop yield was used as an indicator of the impact of these systems on the environment. The result of the study will be communicated through an online spatial tool which would assist the farmers in exploring potential impacts of different tile drainage systems. In conclusion, it is recommended that impacts associated with new agricultural projects should be assessed like any other major resource capitalization project. For existing projects, it could be beneficial to assess the impacts associated with the agricultural activities before they are implemented or conduct LCA to study the impacts associated with the production of a crop.

Understanding the Legislative Decision Framework of Social Considerations in Environmental Assessment: A Dual Case Study of Radioactive Waste Management in Canada (April 2018)

Author: Taline Kalindjian

Employer: Canadian Nuclear Safety Commission

Abstract

Radioactive wastes have been increasing ever since the expansion of the nuclear industry in Canada, where long-term solutions have not been applied yet. One of the challenges of radioactive waste management in the environmental assessment process is due to the lack of social considerations i.e. participation, perception about the nuclear waste management projects, and the protection of the public and the environment. The aim of this report is to explore the social challenges in radioactive waste management and analyze how public participation affects the legislative decision-making in environmental assessment. A dual case study, within which both are radioactive waste management projects, (1) the Deep Geological Repository and (2) the Port Granby Project were used to qualitatively compare the extent of social considerations against each other, and to certain criteria that were set (requirements of public participation, levels of involvement, eight key elements for meaningful public participation, and nuclear specific social challenges). The results of the study demonstrated that a gap still exists in meaningfully considering the social aspects and public participation in the environmental assessment of radioactive waste management projects. The social aspect should be further improved in the environmental assessment process for radioactive waste management to ensure transparency and openness in decision-making.

Tracking the Incorporation of Climate Change Adaptation Considerations in Quebec EA – Quebec Status Report Prior to EA Reform (April 2018)

Author: Léa Neumark-Gaudet

Employer: Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques

Abstract

Based on a comprehensive review of relevant literature, this essay draws out the history associated with efforts to better consider climate change adaptation within the EA framework in Quebec as well as internationally. The report builds on an understanding of the local situation with regards to the EA process and climate change impacts of concern. These background elements are necessary to develop a clear understanding of the five (5) cases selected for review: 1) Remodeling of the Laurette River; 2) Réseau Électrique Métropolitain (REM); 3) Raglan Mine II & III; 4) Turcot Interchange; and 5) Shoreline Stabilization at Lac Saint-Jean. The criteria for analysis of the cases, which stem from the literature review, provide a preliminary assessment of the guality and the extent of adaptation considerations within the selected EAs. The findings from this study show evidence of climate change adaptation consideration in three out of the five selected studies. The extent and quality varied according to project type. For example, from the cases selected, the quality and extent on of climate change considerations was higher in the projects that involved interventions in the hydrous environment, as opposed to those in the transportation sector. Due to sample size and the sample selection method these findings cannot be generalized to the entire population of projects subject to an EA prior to the reform. The cases are however useful illustrative examples of what has been done and, in certain cases, of missed opportunities that could be useful for a Quebec-specific guide to incorporating climate change in environmental assessment (EA).

Assessing the Effectiveness of EIA in Terms of Scoping Out Biophysical Impacts Caused by Federally Regulated Pipelines: The Case Study of Trans Mountain Expansion and Enbridge Northern Gateway Pipeline Projects (March 2018)

Author: Pavla Karaskova

Employer: Podium Energy and D&G Enviro-Group

Abstract

An increase in demand in the global energy sector has brought to light many issues. Undetected and unreported pipeline spills are becoming a commonality. According to the Transportation Safety Board of Canada, there were 101 pipeline incidents reported in 2016, 100 incidents in 2015 and record bearing 170 incidents in 2012. This study aimed to assess the effectiveness of the EIA reports of the proposed Trans Mountain and Northern Gateway pipeline projects in terms of scoping out biophysical impacts. The effectiveness assessment of the two reports was assessed based on the proponent's capability to establish a clear purpose that proves its commitment to environmental protection, to present a realistic project alternative analysis, to establish a relevant baseline study, to thoroughly assess valued ecosystem components and successfully assess and communicate the project's risks and uncertainties. It was found that the EIA report of the two case studies was moderately effective in scoping out biophysical impacts. This result is due to the fact that there are still concerns that need to be addressed. The purpose section of the Northern Gateway project lacked a reference to its commitment to environmental protection; the baseline studies of neither report made a reference to past conditions of VECs; neither report assessed alternatives to the project and both reports poorly communicated uncertainties. Further monitoring of pipeline EIAs needs to be implemented in order to document the needed improvements for EIA and establish universal standards for EIA effectiveness.

On the Application of Environmental Assessment to Mining in Ontario (March 2018)

Author: Trevor Bell

Employer: Ontario Ministry of the Environment and Climate Change

Abstract

The Ontario Environmental Assessment Act (EAA) applies to public sector projects rather than to private sector projects such as mines. The Class Environmental Assessment (Class EA) is Ontario's streamlined self-assessment process for activities with predictable and manageable impacts. Under the EAA, selected mine components (e.g. electricity transmission facilities and not the entire project) undergo Class EAs. Recently, several proponents of northern Ontario mine projects have undertaken Individual Environmental Assessments (IEAs) through voluntary agreements with the province. This report compares and assesses strengths and weaknesses of the Rainy River Project IEA and the Victor Mine Power Supply Class EA. The results of the comparison show the IEA was more stringent for numerous reasons. These results serve to inform recommendations that Ontario should create a new regulatory instrument to subject mines to the full requirements of the EAA.

Incorporating climate change considerations in the Environmental Assessment process: What Canada can do better (January 2018)

Author: Adam Pinchefsky Employer: Pollution Probe

Abstract

Global climate change has emerged as one of the greatest environmental challenges of our time and has long term implications for humanity. This paper will examine how Canada currently uses environmental assessment (EA) to mitigate GHG emissions at the project level and how Canada can improve its current process. A thorough literature review was conducted to analyze how best to incorporate climate change mitigation in EA. The analysis of the literature identified eight recommendations for improvement in the way Canada currently addresses climate change mitigation in EAs. Canada should include climate change mitigation in the Canadian Environmental Assessment Act, which would allow for greater incorporation of jurisdictional GHG emission targets, would mandate a GHG threshold to trigger an EA, would include GHG emissions when evaluating project alternatives, and would provide stronger enforcement of mitigation measures during the monitoring stage. Canada's guidelines for incorporating climate change mitigation in EA can be improved to clearly define GHG emissions impact significance, assign proper spatial boundaries during the scoping phase to include downstream emissions and to include a more thorough list of mitigation measures. Using a case study of the Tamarack integrated oil sands project, the use of climate change mitigation assessment in the EA process will be examined based on how well the EA followed the current federal guidelines and how it could have better assessed climate change mitigation in relation to the recommendations in this paper. The implementation of these recommendations would improve how climate change is assessed in the EA process and help Canada reach its climate goals. EA can be a useful tool for climate change mitigation if important and necessary changes are implemented.

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A Review of Canadian Strategic Environmental Assessments Regarding their Extent of Integration of Climate Change Considerations (December 2017)

Author: Nour Nader

Employer: Secretariat of the Convention on Biological Diversity (SCBD)

Abstract

Climate change (CC) is one of the major challenges that the planet is facing nowadays, and solutions to fight it are more than ever in need. One reason behind this lack of progress, seems to be the rather weak performance of strategic environmental assessments (SEA) in including CC considerations worldwide. Thus, this paper has reviewed Canadian SEA reports published by several departments and agencies for their extent of integration of climate change considerations, according to the best practices in the domain. The results showed that the actual framework used in SEAs has a lot of limitations, due to its unstructured and generic nature, which is leading to a low quality of SEAs in terms of inclusion of climate change, and the non-achievement of the SEA best practices. Canada did not seem to be on track to achieve its national target for greenhouse gas emissions reduction. In order to better include climate change in SEAs in Canada, cooperation between the departments and agencies must take place, with the publication of a single SEA report for all entities. CC adaptation planning should be added to this document rather than being part of a separate report. Furthermore, Regional Strategic Environmental Assessment should be used in addition to the national SEAs in Canada. Lastly, cooperation among jurisdictions should be put in place in Canada for SEA systems to be harmonized, and in order to achieve national climate change goals.

Past Sustainability Assessments and the Future of the Federal Environmental Assessment Regime in Canada (December 2017)

Author: Timothy Zarins

Employer: Canadian Environmental Assessment Agency

Abstract

The ongoing federal environmental assessment (EA) review is examining how the federal EA regime can be enhanced to rebuild public trust and provide more robust EAs. Many stakeholders in the review have stated that the inclusion of sustainability assessments (SAs) within EAs could be implemented to address stakeholder concerns. The objective of this report is to explore ways of effective cooperation between jurisdictions within the context of SAs and synthesize how they can be used to improve the current federal EA regime. This report centers on the following research question: How can past EAs under the former Act and EAs under the current Act inform a new sustainability regime in Canada? In order to explore this question, stakeholder comments were compiled to identify the most common concerns voiced by stakeholders with regards to the current federal EA regime. These concerns were then explored within two well-known Canadian SA cases (Voisey's Bay and the Mackenzie Gas Project) to determine how these projects addressed these concerns. Findings of this project indicate that in comparison to past legislation, the current EA regime will require more cooperation among jurisdictions to ensure that SAs be completed successfully. Joint review panels are the best way to ensure that SAs are achieved. The results also indicate that regional strategic assessments are tools that can greatly increase the effectiveness of future SAs. More cooperation, and guidance and training is required to ensure a future federal SA regime is successful.

The Consideration on Climate Change Mitigation in Environmental Assessment (December 2017)

Author: Katja Hetmanchuk

Employer: Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques7

Abstract

Climate change is the largest and most complex environmental issue of our time. Greenhouse gas (GHG) reduction commitments have emerged as a tool to limit the effects of a changing climate. Quantifying a project's GHG emissions and scrutinizing their effect on climate change are increasingly required in environmental assessment (EA) processes in Canadian jurisdictions. This report investigates if an EA authority's intention for the inclusion of GHG considerations results in the implementation of these considerations into environmental impact statements (EISs) by proponents. From this investigation, the question of how the consideration of GHG emissions in the EA process influences the achievement of GHG reduction targets is explored. Fifteen projects across five Canadian EA jurisdictions were reviewed. An examination of projects at the federal level and in British Columbia, Ontario, Quebec and Nova Scotia revealed that an EA authority's intention was not always reflected in EISs. Well-developed intentions by EA authorities did not necessarily result in proponents following guidelines for GHG consideration in their EISs due to the absence of regulation or a defined policy. Conversely, an underdeveloped intention by an EA authority sometimes resulted in EISs with thorough GHG assessments. In some jurisdictions where the EA authority intention appeared underdeveloped, there were mechanisms in the EA process through which GHG consideration by the proponent could be compelled. The examination of the five jurisdictions did not reveal how GHG consideration in EA, in its present form, assists in meeting GHG reduction targets. A GHG emissions limit imposed during the EA process could link EA to success in meeting these targets.

Biodiversity and Indigenous Peoples: A Case Study on the Review of Environmental and Regulatory Processes in Canada (December 2017)

Author: Cindy Bertran Cerino

Employer: Canadian Environmental Assessment Agency

Abstract

In 2016, an independent Expert Panel engaged with Indigenous Peoples, in addition to other stakeholders and the public, as part of the review of environmental and regulatory processes in Canada. The review represented an opportunity for Indigenous groups to bring forward their views, concerns and recommendations regarding environmental assessment (EA).

This report focuses on identifying the main concerns and recommendations made by Indigenous groups from the north coast of British Columbia (B.C) to the Government of Canada regarding changes needed in the EA process, specifically related to biodiversity protection. It analyses how the Canadian EA process can be revised to address the concerns, rights and interests of Indigenous Peoples in relation to biodiversity protection.

A biodiversity-related keyword search analysis of each of the nine submissions from north coast BC Indigenous groups was employed to determine the main concerns and recommendations they had related to impacts on biodiversity and their communities. Their recommendations included: joint monitoring to address cumulative effects; implementation of strategic and regional assessments; incorporation of social and cultural components within environmental effects; adoption of collaborative management mechanisms such as adaptive management and comanagement; and meaningful incorporation of Indigenous knowledge throughout the EA process.

The findings highlight the key role Indigenous Peoples play in the protection of biodiversity and the critical importance of their meaningful participation in EA processes.

A Composite Approach to Determination of Significance in Environmental Assessment: Implications for the Yukon Environmental and Socio-Economic Assessment Board (November 2017)

Author: Rox-Ann Duchesne

Employer: Yukon Environmental and Socio-economic Assessment Board (YESAB)

Abstract

The Yukon Environmental and Socio-economic Assessment Board (YESAB) does not have a clearly articulated approach to the determination of significance within its environmental assessment practice. While commonly and universally cited as the heart of environmental assessment, significance determinations are often complex, confusing and poorly understood. The aim of this report is to explore fundamental concepts of significance determination and compare key principles and challenges with current practice at YESAB. The focus is on two resounding and co-dependent notions – the consideration of impact characteristics and the consideration of impact importance – as the foundation for sound significance as presented by Lawrence (2005, 2007). Of particular interest are the implications of adopting one of these approaches, the composite approach, to the determination of significance at YESAB.

This report will first examine the principles of and challenges and approaches to significance determination practices within environmental assessment by reviewing scholarly literature. YESAB's current practice with respect to significance determinations and the implications of adopting a composite approach are then examined in a preliminary manner to better understand where gaps in practice may lie in comparison to best practice. This basic analysis was achieved via the author's personal observations as well as by reviewing environmental assessment reports publicly available on YESAB's online registry that resulted in 'do not proceed' recommendations. Findings suggest that YESAB's current practice with respect to applying impact characteristic criteria is consistent with other jurisdictions. The integration of impact importance, or context, in significance determinations readily appears in the majority of recommendations reviewed. Accordingly, while improvements in documenting practice and processes are needed, YESAB seems engaged in significance determination practices that, to varying extents, meet the criteria consistent with a composite approach.

The Free Prior and Informed Consent of Indigenous knowledge: Lessons learned through Canadian Regional-Strategic Environmental Assessments

(November 2017)

Author: Dillon Crosilla

Employer: Canadian Environmental Assessment Agency

Abstract

Critics argue that amendments to the Canadian Environmental Assessment Act 2012 have weakened Indigenous involvement in the EA process. In response, some have suggested that assessments that are carried out more strategically and on a broader scale would address the lack of meaningful participation of Indigenous groups. This report seeks to determine to what extent Canadian Regional-Strategic Environmental Assessments (R-SEA) that have documented Indigenous knowledge have adhered to the principle of Free, Prior, and Informed Consent (FPIC) endorsed by the United Nations Declaration on the Rights of Indigenous peoples (UNDRIP 2007). Three R-SEA case studies were selected: the Beaufort Regional Environmental Assessment, the Great Sand Hills Regional Environmental Study and the Lower Athabasca Regional Plan. A summary table was constructed to synthesize how each R-SEA complied with FPIC. The methods used by each to engage Indigenous groups were also tabulated and assessed to determine how well they followed the principles of FPIC. The findings indicated that while the principles of 'Prior' and 'Informed' consent were respected within the R-SEAs examined, the principle of 'Free' consent was not. The study found that attempting to examine each FPIC guiding principle individually was problematic; any future research should investigate these principles in a more holistic way. Furthermore, a lack of transparency in the published case study reports and a lack of Indigenous perspective was a limitation on the research. Notwithstanding these issues, the study indicates that Canadian R-SEAs have the potential to create the necessary conditions to use best practice methods for documenting Indigenous knowledge and respecting the FPIC guiding principles.

Aboriginal Empowerment in Natural Resources Development: Consultation in Environmental Assessments and the Duty to Consult (September 2017)

Author: Marie-Joelle Lachance Employer: Sierra Club BC

Abstract

Site C hydroelectric dam and Enbridge Northern Gateway Pipelines are two recent major western Canadian resource development projects that went through deep environmental assessment (EA) consultation with Aboriginal people. The federal court of appeals found that Site C fulfilled Canada's duty to consult, while Northern Gateway did not. Yet, the joint review panels reviewing the environmental assessments found that Site C would have more significant and unmitigable impacts on the environment and on Aboriginal ways of life than Northern Gateway. This report looks at the relationship between environmental assessments, environmental impacts, the duty to consult, and Aboriginal power over natural resources. It analyses two major resource development projects in British Columbia: the Site C hydroelectric dam, and the Enbridge Northern Gateway Pipelines. Canada's consultation does not appear to have empowered Aboriginals to have any influence over either project's decision to proceed, and in the end, based on political actions, it seems that the projects either proceeded or were rejected for reasons more political than anything else. The process, did, however, show increased empowerment of Aboriginals in the planning of the projects compared with the pre-duty to consult era. This report found that, in order to have a more balanced and fair approach in EA consultation, the consultation process should be discussed and agreed upon with the consulted Aboriginals, the government should be legally responsible to ensure that Aboriginals' financing is sufficient for EA consultation and negotiations, and, most importantly, EA consultation should be conducted with the goal of reaching an agreement between the Crown and Aboriginals. The assessment of how both parties worked in good faith towards reaching an agreement should be part of the legal test to assess whether consultation with Aboriginals is sufficient

Prioritizing placement of conservation buffers in the Shire River Basin in Malawi (September 2017)

Author: Yuka Makiyama

Employer: Department of Forestry, the Ministry of Natural Resources, Energy and Mining in Malawi

Abstract

In Malawi, about 80 percent of the population directly or indirectly works in the agriculture sector; however, as a result of increased population growth, available land is becoming scarcer, food security less tenable and reforestation more challenging. Moreover, environmental disasters such as flooding and drought are increasing as a result of on-going deforestation leading to intense environmental degradation. Agroforestry, especially conservation buffers, is part of a solution to improve environmental conditions. There are different projects adopting agroforestry systems in Malawi. However, the scale and number of such projects are limited. The locations of these projects are chosen based on farmer's preference, thus, their robustness in terms of project management is questionable. Site selection criteria for agroforestry must include physical environmental aspects because it is essential to consider both biophysical and socio-economic environment in the Environmental Impact Assessment (EIA). Additionally, the performance and effectiveness of agroforestry depends on soil nature and topology. The objective of this study was to examine appropriate sites for conservation buffers for projects planning purposes in Malawi's Shire River Basin through analysis of sediment trapping efficiency, water trapping efficiency, wetness index, and topographic index. The results demonstrated that Phalombe, Balaka, and Machinga districts indicated higher values of sediment trapping efficiency, water trapping efficiency and wetness index, compared to Thyolo, Mwanza and Mulanje which all had lower values. These results provide valuable information for an EIA more so for decision makers examining proposed and alternative locations for conservation buffers to ensure effective planning for future agroforestry projects.

A Cumulative Effects Narrative: Federal Environmental Assessment Reform on Cumulative Effects Policy (July 2017)

Author: Sarah Vitulano

Employer: Natural Resources Canada

Abstract

Cumulative effects are notoriously criticized for their challenging nature in our current federal environmental assessment (EA) process. Decades of academic research has shown varying solutions to properly address cumulative effects however the many challenges in project cumulative effects assessment (CEA) application dominate over the proper execution of assessment. CEA at the project level is narrow and separate from broader planning contexts. Understanding the aggregation of an effect or impact over time and space in addition to its interactions with other impacts could be extremely difficult. This report reveals that there is a policy gap in our current federal EA system that requires attention for future EA reform. It discusses the historical and current state of cumulative effects in EA and situates them among three types of assessments; regional environmental assessment, strategic environmental assessments, and regional-strategic environmental assessments (R-SEA). British Columbia, Alberta and Saskatchewan case studies are explored to frame CEA in practice. Possible ways of how provinces can inform the federal review process are explained by comparatively assessing mechanisms and tools used in addressing cumulative effects. Scenario modelling was a major recommendation in order to accomplish regional and strategic planning. Literature, case studies, the EA Expert Panel Report and the Government of Canada's Discussion Paper revealed that cumulative effects are best assessed at the R-SEA level. This means that CEA would still be conducted at the project level EA however would only be achieved with the appropriate and necessary policy guidance and with R-SEA as foundational pieces to overcome project CEA challenges.

Integrating climate change adaptation in Canadian Environmental Impact Assessments (July 2017)

Author: Kajal Patel

Employer: Office of the Auditor General of Canada

Abstract

With increasing uncertainties in climate change, it is important to address climate change adaptation at a project level through the Environmental Impact Assessments (EIA), to design and develop the proposed or existing projects resilient in nature. This would include the study of historical data and future predictions of the changing climate in and surrounding the project area as well as its mitigation measures. Canada being recognized as one of the lead countries, encourages the consideration of climate change adaptation into the Environmental Impact Assessments of projects, but has no mandatory requirements although guidance is available.

My paper includes review of worldwide guidance available to integrate climate change adaption into impact assessments, including challenges and recommendations to integrate it. It also includes review of six Canadian case studies to determine the extent of climate change adaptation integrated into EIAs. The case studies are completed Environmental Impact Assessments carried out for various projects in different provinces under the Canadian Environmental Assessment Act, 2012. Overall, it is found that the extent to which the potential environmental risks to the project were determined varied considerably. There is no consistency among the provinces or the responsible authorities in summarizing and describing the environmental risks affecting the projects in the EIA reports. Only two case studies included detailed assessment of the historical data as well as the future predictions of the changing climate. There is room for improvement if the historical data and future predictions of the potential climate change are studied thoroughly and integrated in the design of the project, the current legislation is amended and guidelines on the extent to which it should be included in the EIA report becomes mandatory. The Terms of Reference (TOR) of a project must include this need. Moreover, there should be coordination among the project proponents, the climate scientists and the responsible agencies to get the maximum available data on climate change, to effectively integrate it into the EIA and to determine the relevant mitigation measures.

Spatial data infrastructures - building capacity for web based environmental data sharing to address spatial needs in Environmental Impact Assessment (July 2017)

Author: Reem Hamzeh

Employer: United Nations Environment Programme (UNEP)

Abstract

Spatial information are an important resource in supporting sound and reliable environmental decision making. Several organizations from the public and private sector continuously collect and produce data in this regard, however the data is stored in different places and managed by different organizations, resulting in the lack of efficient use of available data. Furthermore, problems that affect the use of spatial information such as the lack of availability, quality, organization, accessibility, and sharing are frequently encountered in the Environmental Impact Assessment (EIA) process. Spatial Data Infrastructures (SDI) propose technical and organizational measures for facilitating the access to and reuse of spatial data. This report explores what kind of SDI can improve the accessibility, availability and compatibility of spatial data for EIA.

First, data sharing and use challenges in EIA and particularly in Canada were identified. Next, a review of federal environmental assessments was undertaken to demonstrate the extent of spatial information use in Canadian EIA. The results show that the use of spatial information is indeed popular, although the applications employed are generally basic. An evaluation of international SDIs was subsequently undertaken to examine how elements from those initiatives compare to the Canadian Geospatial Data Infrastructure (CGDI). The evaluation used indicators based on the five components of SDI; data, people, access networks, standards, and policy. It was observed that the reuse of spatial information is facilitated when information about data quality, and fitness for use are provided, legal frameworks for data sharing are in place, licensing barriers are removed, consistent pricing policies and user access models are implemented, and a central portal by which nationwide data can be discovered is available.

As a result of this analysis, 6 national and 5 EIA specific recommendations were presented as strategies for improving the state of spatial information sharing in Canada. The main implication from the report was that the development of a publicly accessible web based SDI that meets the information needs of EIA stakeholders presents many challenges, but that political and social factors play a key role in realizing this feat.

Author: Tanya Hage-Moussa

Employer: Environment and Climate Change Canada

Abstract

Environmental Impact Assessment (EIA) and Environmental Compliance and Enforcement (ECE) are well established standard-setting bodies in Canada. Although they are studied within their own rights, little research has been done to examine how these two mechanisms of environmental protection intersect. This report raises awareness of how the work developed in EIAs can affect the outcomes of other regulatory processes like environmental enforcement, and in other government institutions, such as Environment and Climate Change Canada's Environmental Enforcement Directorate (EED). Based on an extensive review of the Canadian ECE-EIA system as well as my observations and experiences working with the EED, I have found that significant connections and convolutions between ECE and EIA occur in the application of a strict enforcement tool: sentencing. Notable environmental court cases, such as R. v. BHP Diamond Inc. and R. v. Teck Metals Limited were selected to contextualize the direct and indirect capacity of EIA to influence the outcomes of environmental sentencing. This report argues that the manner in which efforts of environmental assessment are interpreted in a judicial setting plays a complicated yet covert role in certain elements of sentencing, such as: the use of EIA as documentary evidence to clarify the awareness, intentions, actions, and efforts of an environmental offender; the assessment of EIA mitigating, monitoring and follow-up procedures as applications of standard of care for the sake of evidence of due diligence; and the determination of the degree of harm, foreseeability of harm, remorse, and culpability in a court of law.

Public Participation in EIA from a Developing Nation's Perspective: A Nigerian Context (April 2017)

Author: Brian Aboh Employer: Sierra Club Canada (Quebec Chapter)

Abstract

Public participation plays an important role in reducing the likelihood of conflict by accommodating different interest and values as well as promoting transparency in any development project undertaking. Participation can take many forms, for example, community meetings, administrative laws, citizen advisory committees etc. Regardless of the form public participation takes, the core concept has always relied on the sharing of power among the public and the government.

In 1992, the Environmental Impact Assessment Act (Decree 86) was introduced in Nigeria, with provisions of public involvement in environmental decision-making. Public participation in Nigeria has since improved (Odemene, 2015). Public participation in environmental decision-making is a particularly crucial issue in Nigeria, where oil resource extraction projects in the Niger Delta have been operating since the 1950s with little to no regard for the local environment, which has caused devastating effect on the environment (Nzeadibe et al., 2015).

However, several major challenges still stand in the way of effective public participation in EIA in Nigeria. The Nigerian process contravenes the policy of international public participation adopted in the Aarhus Convention, which requires early public participation, full and complete access to documents and taking into account public opinions into policy-making. Lenders to mining projects, such as the World Bank, are increasingly putting pressure on proponents to implement public participation. The report focuses on the public participation in Nigerian EIAs and draws out major challenges in the way of effective public participation. Nigeria needs to adopt the principles of public participation as identified in international and regional legal instruments to ensure effective participation of the public in the environmental decision-making.

Integrating the Ecosystem Services concept in EIA Recommendations for the CEAA 2012 review (April 2017)

Author: Chloé L'Écuyer-Sauvageau

Employer: Institut des Sciences de la Forêt Tempérée, ISFORT

Abstract

The new Canadian federal government has decided to conduct a review of the Canadian Environmental Assessment Act, 2012, partly to undo the changes that had been undertaken as part of the last government's deregulation agenda (Kinney, 2015). To undertake such a review, an understanding of the social-ecological system within which Environmental Impact Assessment (EIA) practice finds itself is necessary. Given that one of the purposes of EIA is to promote sustainable development, the use of the concept of Ecosystem Services (ES) which is at the interface of social and ecological environments is warranted. The integration of ES in EIA, as well as critiques of the current EIA process, has been the object of a number of studies, but there are few real-world examples of systematic inclusion of the concept of ES in EIA, aside from the recent experience of the International Finance Corporation and the United States Forest Service. Using these recent experiences, I attempt to determine if ES are useful to the EIA process, and if they have been meaningfully integrated in EIA reports. To undertake this analysis, a review of 85 studies submitted to the IFC and 8 studies conducted by the US Forest Service was performed. The choice of studies was based on the type of projects presented, the availability of documents and whether or not the terms "ecosystem services", "environmental services", or "ecological processes" were used in the reports. The most interesting aspect of the concept of ES is that it can be used as a tool to communicate and frame interrelated environmental, social and economic issues. The key impacts of this report will be to aggregate in a single document the main issues associated with the EIA practice in Canada, as well as include an analysis of the appropriateness of including the concept of ES in the EIA process.

Incorporating River Dynamics into Fluvial System Assessments and Policies: A Comparative Analysis of Risk Assessments on Land Prone to Quick-clay Landslides in Québec and Ontario (April 2017)

Author: Sara Munčs

Employer: National Capital Commission

Abstract

Quick clay landslides are a dangerous mass movement occurring in hillslopes when clay formed through the deposit of marine sediments liquefies and flows downslope. The risk of their occurrence can be affected by, amongst other factors, a loss of lateral support at the base of hillslopes due to fluvial erosion of river banks. The management of fluvial systems is therefore linked to the management of this risk. Bank stabilization and erosion control are often selected as interventions to reduce the risk of these landslides occurring. However, these engineering-based solutions fail to acknowledge natural river dynamics resulting in damaging environmental impacts as well as increased vulnerability to these disasters. This report seeks to understand how river dynamics is addressed in risk assessment and management related to guick clay landslides, how policies related to fluvial systems affect this relationship and how community and environmental vulnerability are approached in relation to this risk. Two cases, a risk mapping exercise in Ontario and the response to a fatal landslide which occurred in Saint-Jude Québec, are compared in order to respond to these queries. Existing watershed management organizations, policies and procedures are well integrated into the Ontario case resulting in a good acknowledgement of river dynamics. Unfortunately, while similar watershed management organizations exist in Quebec, a lack of proper economic and political support for these institutions can partially account for the lack of integration of river dynamics into the Saint-Jude case. Ecological and community vulnerability is also addressed more successfully in the proactive risk mapping report in Ontario. Both provinces, however, could benefit from emphasizing mandatory, proactive risk assessments in order to truly reduce vulnerability to such events.

Indigenous Knowledge and Environmental Assessment: A Case Study of the Prince Rupert Export Terminals (April 2017)

Author: Jane Stringham

Employer: Canadian Environmental Assessment Agency

Abstract

Indigenous traditional knowledge (ITK) is a component to be considered in environmental assessment (EA) and management according to the Canadian Environmental Assessment Act, 2012. ITK is a body of knowledge built up by an indigenous group of people through generations of living in close contact with nature. The Canadian Environmental Assessment Agency (CEAA) is involved in allowing for proper consideration of ITK in the EA process. Allowing for proper consideration of ITK is a nuanced role that requires understanding of the history of indigenous people in Canada and the specific contexts in which ITK is generated and preserved. This report will look at three export terminal EAs in the Prince Rupert, British Columbia harbour area: the Fairview Terminal Phase II Expansion Project, the Canpotex Potash Terminal and the Pacific NorthWest Liquefied Natural Gas Project. Each of these three projects involve different proponents, but the indigenous groups consulted are all the same. In this report, the case studies are compared and subjected to a critical analysis of how ITK was considered for the Valued Ecosystem Component (VEC) of salmon. The goal is to determine examples of potential best practice. From this critical analysis, a recommendation on the scale of EA operations is presented. Specifically, there should be an adoption of regional strategic environmental assessments (R-SEA) at an ecological scale, such as watersheds, to better capture the concerns raised through ITK consultation. CEAA can support the implementation of this new scale through training opportunities for stakeholders involved in future EAs.

Evaluating the Practice of Federal Environmental Assessment Before and After the Implementation of CEAA 2012: Case Studies of Selected Metal Mining Projects with a Particular Focus on Scope, Impact Significance, Cumulative Effects Assessment and Enforcement (April 2017)

Author: Valeria Trendafilova

Employer: Canadian Environmental Assessment Agency

Abstract

This report examines some of the changes that came along with the Canadian Environmental Assessment Act of 2012 and how EAs from before and after this new Act compare in practice seeing that the academic field has been very critical of the changes it brought. I conclude that, within the limited scope of this report, little has changed in how federal EAs are conducted as I demonstrate through examples on significance determination and cumulative impacts assessment. While the scope of EAs has been narrowed to matters under the regulatory power of the federal government, in practice proponents continue to conduct assessments that are more comprehensive than some assessments conducted under the old Act. I provide evidence that the concerns regarding the changes in coordinating provincial and federal assessments and the removal of screening-level assessments are unfounded, based on research conducted by the Agency and provisions of CEAA 2012. I also discuss why the main strength of the new Act, the provision on enforcement, which did not exist before, shows much promise in ensuring adequate environmental protection. It must be noted that two major areas that have been touched by the changes in the new Act, legislated timelines and certain restrictions on public participation, have only been briefly mentioned here and further analysis into the effects they may have on the federal EA process is necessary in order to consider the information presented here as conclusive evidence in regards to the overall impacts of the changes introduced with CEAA 2012.

Marine Protected Areas on Nova Scotia's South Shore: Making the Case for Community-based Participation (April 2017)

Author: Ariel Smith

Employer: Bluenose Coastal Action Foundation

Abstract

Effective marine protection around the world has faltered in part due to the complexity of marine environmental systems and our limited knowledge regarding ecological interactions. Compounding the ambiguous nature of marine biological conditions are inadequate measures in addressing social objectives in the context of marine protected area (MPA) planning. The Canadian government recently revitalized programs for marine protection across Canada since the Liberal introduction to parliament in 2015, with refocused efforts on the goals set out in the United Nations (UN) Convention of Biological Diversity (CBD). In Atlantic Canada, Fisheries and Oceans Canada (DFO), Oceans and Coastal Management Division have determined 54 Ecologically and Biologically Significant Areas (EBSAs) across the Bay of Fundy and Atlantic coasts to inform the MPA process, and have contracted community-based environmental groups across the region to participate in the consultation and research phases. This report will explore the potential for community-based involvement in MPA planning using the internship experience at Bluenose Coastal Action Foundation in Lunenburg, Nova Scotia. A critical analysis of Canada's marine protection progress and government incorporation of First Nation perspectives during marine planning will outline current challenges and limitations by referencing the internship case study. By assessing the research and practical implications of community-based participation and engagement in the MPA designation process, this report argues the necessity of incorporating human components into ecological planning to ensure effective long-term protection and monitoring of coastal and off-shore MPAs in Nova Scotia by acknowledging First Nation and local community's involvement in the larger assessment process.

Une analyse critique de l'Evaluation Environnementale de Site au Québec : En quoi ce procédé peut pallier certaines limites (January 2017)

Author: Christopher Hak

Employer: Gestenv Inc.

Abstract

L'Evaluation Environnementale de Site (EES) est un procédé environnemental se divisant en trois parties et consistant à identifier, à déterminer et à supprimer une potentielle contamination des sols et des eaux souterraines sur un site. La phase I vise en premier lieu à effectuer une recherche de plusieurs dossiers ayant pour but de connaître l'histoire et le passé du site étudié, ainsi que d'identifier les utilisations antérieures du site et ainsi cibler les possibles polluants présents sur le terrain. La phase II, quant à elle, a pour but de confirmer les résultats trouvés lors de la phase I en identifiant et en définissant la nature et la quantité exacte des contaminants se trouvant sur le site à l'étude. Cette phase peut également servir à définir les besoins pour des actions de remédiation et d'élimination des contaminations présentes sur le terrain.. Le présent rapport analyse en détail les méthodologies de l'évaluation environnementale de site phase I et Il en examinant deux études de cas, ce qui permet de mettre en lumière les différentes caractéristiques de la méthodologie d'Évaluation Environnementale de Site. Ces résultats pourraient être utiles pour améliorer le processus fédéral d'Étude d'Impact Environnemental (EIE) afin de pallier certaines de ces limites, d'autant plus que ce procédé est en ce moment même en cours de révision par un panel d'experts formé par le Ministère de l'environnement et des changements climatiques. Ce rapport met en évidence l'idée selon laquelle les recherches historiques effectuées lors d'une EES-phase I pourraient être utilisées lors de l'analyse des impacts cumulatifs d'une EIE. En effet, les experts omettent souvent l'étude des activités antérieures qui auraient pu se dérouler sur le site à l'étude. Il est donc primordial, afin que l'analyse des impacts cumulatifs soit rigoureuse et pertinente, que des recherches historiques du site à l'étude et des terrains avoisinants soient effectuées afin de déceler toute contamination antérieure potentielle. De plus, les rapports d'EES pourraient constituer une source d'information importante concernant l'état des sols et des eaux souterraines d'un terrain, ce qui pourrait servir pour déterminer l'état environnemental initial du site, ce qui est nécessaire lors de l'étape de scoping d'une EIE. Néanmoins, l'EES concerne seulement la contamination des sols et des eaux souterraines, ce qui représente une infime partie du champ d'étude d'une EIE.

Using Artificial Neural Networks as a Prediction Tool in EIA (January 2017)

Author: Victoria Curl Employer: Beak Consultants GmbH

Abstract

Using artificial intelligence (AI) has a long history in environmental science. Given the general complexity and unpredictability of natural systems, environmental data is well suited for certain types of AI platforms in order to make predictions and forecasts about environmental trends. Although the use of Al for environmental science has been explored for years, there is little to no research that exists focusing on the utility of AI in environmental impact assessment (EIA). In this report, an analysis of case studies is undertaken to examine the applicability of AI to forecast environmental impacts in EIA specifically related to air pollution, water resource management, wildlife management and hazards. A mining case study that was completed at Beak Consultants GmbH is also presented. This case study demonstrates how easy and user-friendly ANNs can be when they are developed for a familiar platform and for an environmental purpose. ANNs have already been used for mining exploration, but can also be integrated for other purposes such as the analysis of future environmental impacts on the surrounding environment. As AI becomes more accessible and more user-friendly, it has the potential to become a common tool used by EIA practitioners to carry out prediction and monitoring. While AI has the potential to provide accurate environmental forecasting and save significant time and resources in the EIA process, it is not without its scientific and ethical limitations. However, with further development for specific environmental forecasting purposes, AI has the potential to be a useful technology to add to the growing number of environmental informatics resources that aid in the EIA process, especially when it comes to strategic planning of current and future developments and the analysis of cumulative impacts.

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Information Disclosure as a Tool for Environmental Policy and Potential Adoption into Canadian EIA (December 2016)

Author: Natalie Devillers

Employer: ERA Environmental Management Solutions

Abstract

An environmental reporting internship at ERA Environmental Management Solutions in Montreal sparks an interest in Right-To-Know provisions due to the Toxic Release Inventory reporting due July 1st, 2016. A brief review of the Right-To-Know provisions of the TRI information disclosure program demonstrates that a company's environmental performance is improved due to the resulting pressure, in addition the environmental burden and injustice on communities is reduced. Information disclosure is then critically evaluated and limitations addressed for the use of such programs as a substantial tool in environmental policy. The potential of information disclosure programs for use in Canadian EIA's is discussed and contextualized within the reform of CEAA 2012 proposed by the Trudeau Government elected in 2015. It is concluded that information disclosure programs are a respected tool for environmental policy and would be an esteemed improvement to the public consultation aspect of Canadian Environmental Impact Assessments.

European & Canadian Perspectives for Alternative Mining Methods (December 2016)

Author: Kristine Brossard Employer: G.U.B. Ingenieur AG

Abstract

Biomining practices have gained increasing interest internationally for this potential application in the mining industry. Biomining is the use of micro-organisms to extract metals from low grade ores, tailings, waste rock and contaminated sediments. The European Union (EU) is now studying the in-situ application of biomining to extract metals from low grade, deep ore deposits that cannot be extracted through conventional mining practices. This process is called deep in-situ biomining (DISB) and requires the combination of hydraulic fracturing and subsequent bioleaching for metal extraction. The aims of this report to critically analyze environmental legislation in the European Union and in Canada as well as to critically analyze the environmental implications of deep in-situ biomining. A review of environmental impact assessment reports on conventional mining of uranium was completed to compare the severity of the impacts of these methods to the potential impacts of deep in-situ biomining. These investigations found that more stringent environmental legislation with clear targets, vocabulary, objectives, timelines, incentives and reporting strategies are needed in the EU and in Canada in combination with less wasteful mining practices to address issues of sustainability in the mining sector. Overall, the risk matrix showed that the environmental impacts of DISB were lower than those of conventional mining practices. Some lessons from the EU environmental framework such as mandatory reporting could be applied in Canada to help improve transparency and compliance to environmental standards in the Canadian mining industry.

Risk Communication in Environmental Assessment: Case study of a major Canadian project, the Energy East Project (November 2016)

Author: Mohammad Amdadur Rahman

Employer: Canadian Environmental Assessment Agency

Abstract

Risk communication offers significant possibilities for building public trust and transparency in environmental assessment (EA), but it also faces challenges. Effective risk communication helps to establish a reasoned dialogue between the proponent of a project and various stakeholders that can be fruitful to all parties involved. Yet, there is a fundamental and somewhat permanent divide in the way experts present risk information and the way most people conceptualize risks. Experts tend to give equal weight to probability and consequences, whereas laypersons tend to give more weight to consequences. Risk communication often fails to discuss uncertainties associated with risk assessments which further increases public distrust in experts and policymakers. These aspects are reflected in the case study examined here. In this report, the risk communication approach of a major energy project in Canada, the Energy East project, is analyzed based on ten essential criteria of a successful risk communication message. The analysis shows that the proponent ignored or failed to acknowledge the special nature of the risks involved and the public concerns about these risks. The probabilities of risks were communicated in a selective fashion. This can seem to portray too safe a picture and cause a loss in public confidence in the proponent's assessments. Moreover, uncertainties in the assessments were not mentioned at all. Proponents need to address public distrust with robust risk communication approach acknowledging the concerns of the public and adopting transparency to build credibility of the risk information they want to communicate.

Measuring Quality of Communication in EIA Reports (November 2016)

Author: Stephanie Pelletier Employer: David Suzuki Foundation

Abstract

Environmental assessment documents in Canada, for the past 13 years are available online to the public on the Canadian Environmental Assessment Agency (CEAA) registry. As online information sources become more and more relied on as primary sources of information by the general public, greater attention needs to paid to the quality of the written material that is made available. The assumption that environmental assessment reports should be complicated is erroneous. Rather, I advocate for environmental assessment reports that incorporate efficient communication, which proponents and other authors of environmental assessment reports can achieve by using readability tools, which measure for comprehensibility.

A comprehensibility assessment was conducted on 141 environmental assessments using a readability tool software, which provides a grade when text is placed into the software. The grades generated represent the level of education needed to understand the excerpt submitted in the text analyzer. All the projects available on the CEAA registry from which documents available were analyzed and graded.

The resulting average education grade for environmental assessment report comprehensibility was found to be 14.6 years of education, with a mean level of readability ease of 39.2. This suggests that current environmental assessment documents are difficult to understand by the general public. Increasing the quality of written documents for environmental assessment could maximize the effectiveness and transparency of communication during the EIA process.

Health in Environmental Assessment: An evaluation of the consideration of potential health impacts in Canadian EA with a focus on road infrastructure projects (October 2016)

Author: Natasha Sarah Valavy

Employer: D&G Enviro-Group Inc.

Abstract

Human health is undeniably related to the surrounding physical and social environments, though it is rarely considered in environmental assessment (EA). The main objective of this report is to analyze the assessment of health considerations in Canadian EA, with a particular focus on assessments for road infrastructure projects. EA for road infrastructure projects was chosen as a relevant illustration in light of the considerable effects transportation is known to have on humans. The report begins with a literature review of the theory and practice of incorporating health considerations into the seven steps of EA. Decision support tools such as health impact assessment (HIA) and environmental health impact assessment (EHIA) are then discussed and compared with the practice integrating health directly into the EA process. Furthermore, known and speculated health effects associated with changes caused by road infrastructure projects are then presented in order to showcase the significance of health considerations in this context. The practice of considering health issues in EA is then examined through the case study of the New Bridge for the St-Lawrence project. The case study shows that only environmental effects that directly influence health through physical means are considered. The analysis identifies four key recommendations on how health can be better integrated into EA through: the broadening of project scopes to include physical and social dimensions in reference to health; the collaboration of EA practitioners with public health experts; the improvement of follow-up methods in order to inform similar EAs in the future; and the improvement of public participation practices throughout the EA.

Integration of Socio-Economic Assessment into Environmental Impact Assessments (June 2016)

Author: Hayat Makkee

Employer: Canadian Environmental Assessment Agency

Abstract

The ability of social impact assessment to manage and minimize the adverse effects of the physical intervention is increasingly acknowledged by environmental assessments experts and practitioners. Potential adverse effects can be effectively identified and managed when social impact assessment is integrated into environmental impact assessment. The social and economic conditions, like biophysical environment biophysical environment –air, water, land and wildlife - can be influenced by physical intervention. This means human beings can be affected by the proposed project via the impacts on biophysical, social and economic changes. Therefore, environmental impact assessment should not be limited only for identifying and evaluating the effects of a project on biophysical components. It should be more comprehensive by considering the effects of this project on social and economic aspects. The main objective of the current study is to demonstrate how the direct and indirect impacts created by a proposed project can be identified, linked and assessed by incorporating social impact assessment into the environmental impact assessment process.

The study presents both environmental and social valued components that can be considered in the proposed integration process. It also shows how and when the social impact assessment can be conducted when a project causes environmental changes which lead to several socioeconomic impacts. The current investigation indicates that the social impact assessment can be applied at all various stages of environmental impact assessment process not only during scoping stage. The relationship between Canadian Environmental Assessment Act 2012 and the social impact assessment under CEAA 2012 has hitherto been limited to the evaluation of biophysical impacts and usually the social and economic effects are underestimated. Although CEAA 2012 addresses the health and socio-economic conditions, the requirements of environmental assessment under CEAA 2012. Finally, the current investigation illustrates that the integration between social and environmental assessments can enhance the decision making process concerning the effects of a proposed physical intervention.

As Long as this Land Shall Last": The Role of Indigenous Counter-Maps in the Struggle for Self-Determination in Northern Canada (June 2016)

Author: Jeff Hackett

Employer: Firelight Research Inc.

Abstract

The production of maps has predominantly functioned as a technology to reinforce the political and territorial empowerment of states, industry, and elites. Here, maps reiterate the dialectical relationship between power and space, which reinforce a medium of hegemony rooted in symbolization, generalization, and classification. However, because maps depict a subjective and specific worldview rather than objective reality, maps can also be used to challenge and undermine dominant ways of conceiving the landscape and the socio-political realities they represent. Increasingly perceived as a promising technique to counter hegemonic spatial narratives, Indigenous peoples have employed counter-mapping techniques to meet a variety of needs and circumstances. While a wide range of activities have been carried out under the banner of Indigenous counter-mapping, maps have played a prominent role in attempts to defend Indigenous rights to customary land and resources. To this end, Indigenous counter-maps have become contemporary sites of struggle and resistance. The Saulteau First Nations Traditional Knowledge and Use Study undertaken for the proposed Nova Gas Transmission Ltd. North Montney Mainline Pipeline project serves as a forum to critically examine and evaluate Indigenous counter-mapping strategies to promote Aboriginal and treaty rights within the Canadian environmental assessment process. Through the critical concepts of power, indigeneity, and space, this research demonstrates how Indigenous counter-maps contribute to the resistance of large-scale industrial resource development projects, and yet simultaneously reiterate and rework familiar colonial constraints on Indigenous peoples. Without undermining the importance of Indigenous counter-maps, the research seeks to develop a more critically informed understanding of their possibilities and limitations within environmental assessment.

Generic Sustainability Maturity Model for an Information and Communication Technology (ICT) Company (May 2016)

Author: Fatima Farooq

Employer: Ericsson

Abstract

In the recent era, there has been a tremendous boom in the Information and Communication Technology (ICT) industry worldwide. The ICT industry contributes 2% of total GHG emissions and this percentage is estimated to increase significantly in the coming years. ICT has the potential to reduce its adverse impacts considerably that are associated with its processes by sustainable management. ICT is a relatively new field and it has fewer than desired guidelines and best practices available. The following study focuses on Ericsson Montréal- one of the world's leading ICT companies as its case study. This report discusses ICT and its relationship to the sustainable development, numerous ICT industry standards, various maturity models (such as Capability Maturity Model and Business Maturity Model) and ICT sustainability best practice case studies, which helped in the derivation of a Generic Sustainability Maturity Model. Therefore, this report will encourage and help Ericsson Montréal or any ICT company to benchmark current performance, develop initial roadmaps and devise action plans. It has the potential to provide a path for more detailed and quantitative studies in the future. In addition, it may also serve as an assessment tool for comparative analysis between similar companies. The generic nature of the model makes it useful to any ICT company and it can also be tailored according to particular needs. However, there are certain limitations to the study such as time and scope of my internship.

Performance Auditing of Environmental Impact Assessment: A Public Sector Tool to Improve the Process (May 2016)

Author: Makeddah John Employer: Office of the Auditor General

Abstract

Environmental impact assessment has been deemed a tool for advancing sustainable development outcomes worldwide. It is unfortunately plagued by many weaknesses. Performance auditing is being proposed to facilitate improvements. Performance auditing, an independent assessment, examines policy and programmes to detect failings in performance. Most countries around the world have EIA legislation and can thus be subject to auditing. As part of this report, a review of 8 performance audits of EIAs in 5 countries and one Canadian province was undertaken to glean how various countries have undertaken EIA audits with regard to methodology, aspects investigated, findings and challenges. Two surveys, administered by the Working Group on Environmental Auditing, and a literature review were also relied upon to inform this research paper. This research determined that the three aspects of the EIA process – the institutional arrangements and public participation; quality of EIA reporting and decision-making; and impact management and follow-up - are all afflicted with issues that impede the effectiveness of the EIA process, particularly impact management and follow-up. In response, this report recommends developing three main resources for audit offices undertaking EIA audits: 1) a risk analysis using the three major aspects of the EIA process to help focus the audit where it is most needed; 2) a list of the sources of criteria available that can be used to develop the audit objective; and 3) advice on methodology such as sampling.

Evaluation of the Effectiveness of EIAs' Environmental Management Plans - The Landscaping Project for the Liquid Natural Gas Fractionation Plant (PFLGN) (Pisco, Peru) as a Case Study (April 2016)

Author: Liana Gabriella Gonzalez Blacker

Employer: Environmental Resources Management (ERM) Lima, Peru

Abstract

In 2006, as part of the commitments assumed in the Environmental Impact Assessment (EIA) for the installation of the PFLGN, a Landscaping Project was implemented around this Plant. The intent of this project is to give continuity to the landscape of the area and to minimize the visual impact generated by the PFLGN in the desert ecosystem where it is located. For this purpose, various plant species and landscape features such as dunes, gullies, tree groves, etc. naturally existing in the Buffer Zone of the Paracas National Reserve (RNP) were introduced. The Monitoring Program which evaluates the Landscaping Project since 2011 has been able to identify that the latter would be serving as a species refuge or congregation areas. The objectives of this research center around verifying this assumption by comparing the results of the Landscaping Project against two Target Areas: the natural ecosystems from which the Landscaping Project was conceptually designed and the disturbed conditions that existed prior its implementation. The results of these comparisons for the bird and arthropod components suggest an evolution of the Landscaping Project from the initial state prior to its implementation, identifying similarities in various parameters studied with the natural ecosystems. Based on the results, it is proposed that these efforts be replicated around similar industries since they are consistent with the objectives of creating a Natural Protected Area (ANP) that rescues their landscape value.

The State of Climate Change Resilience in Federal Environmental Impact Statements (April 2016)

Author: Wills. D. Tobin

Employer: US Council on Environmental Quality

Abstract

In recent years, guidance from the Council on Environmental Quality (CEQ) and the policy statements of other U.S. federal agencies have advised federal practitioners of the National Environmental Policy Act (NEPA) to consider the impacts of climate change on project development and design. The surging academic literature on climate resilience has also advised the same for the future resilience of infrastructure and to safeguard local economies. As such, are U.S. Federal agencies considering resilience to climate change in NEPA Environmental Impact Statements (EIS)?

In this report, I address this question in four ways. First, I provide a comprehensive literature review to explain the development, evolution and effective use of resilience in project development. I then use this literature review as the fundamental basis to derive a typology based on five criteria of resilience; anticipation, preparation, adaptation, withstanding and response and recovery. Second, I then use these five criteria to classify 115 federal NEPA EISs using this typology. Third, I discuss the various implications of the data collected and the derived typology. Fourth, I outline the limits of my analysis and the potential implications for future research in this area.

Although 37% of EISs were classified into anticipating climate change, only 16% of EISs successfully made project design adaptations to climate change. However, I found no EIS that considered the last two classifications of resilience, withstanding or response and recovery in project design. The results vary widely because some agencies consider climate change resilience much more than other agencies. For example, the United State Army Corps of Engineers (USACE) showed an 85% increase in the number of EISs that considered climate change from 2012 through 2015, while the Federal Railroad Administration (FRA) had much fewer in the same time period. In sum, I find that resilience is increasingly being considered in EISs but there are many barriers, which hinder its proliferation. I discuss these barriers in turn.

Strengths and Weaknesses of the Federal Approach to Contaminated Sites Management within the Context of the Canadian Environmental Assessment Act, 2012 (April 2016)

Author: Alexandra Iliescu

Employer: Environment Canada

Abstract

The Canadian Federal government has developed an elaborate management program for federal contaminated sites. Although the primary purpose of contaminated sites rehabilitation or risk management is to protect the environment and promote sustainable development, changes brought about by CEAA 2012 eliminated the requirement to conduct a formally structured EA for rehabilitation projects.

The ability of federal contaminated sites management processes and practice to be truly protective of the environment and to promote sustainable development was evaluated using twelve criteria that reflect EA best practice. The evaluation was done in the form of a table, in which the same criteria were also used to evaluate the EA processes for designated and non-designated (Section 67) projects under CEAA 2012. The weaknesses and strengths of the federal contaminated sites management process, as well as those of the federal EA processes for designated and non-designated (Section 67) projects were assessed, and the comparative analysis permitted to determine whether Section 67 requirements can fill gaps where criteria are not adequately fulfilled by federal contaminated sites management (CSM). Information for the analysis was collected through literature review, interviews with two government employees involved in CSM; and a rehabilitation project case study.

The analysis revealed that, although federal CSM process and practices can fulfill some criteria that reflect EA best practice, they lack some of the necessary tools to carry out an acceptable evaluation of the potential environmental impacts of site remediation or risk management approaches and projects. The federal CSM process performs well in terms of early information gathering and incorporation into project planning, the relatively integrated assessment of a broad range of environmental components, its use of scientifically sound methods and data, and its flexibility/adaptability. However, federal CSM framework does not provide for the assessment of cumulative impacts, is not capable of ensuring on its own the adequate or any assessment of alternatives, public involvement, impartial and transparent decision-making, and follow-up and compliance. These shortcomings mainly result from the fact that federal CSM is not founded in legislation, and the analysis indicates that *current* federal EA processes cannot fill in those gaps.

In light of these findings, the principal recommendation is that a legislated EA requirement similar to that (or an improved version) of the screening-type EA under the former CEAA, should be reinstated in federal EA for smaller projects. Furthermore, it is recommended that CSM practices shift away from using solely conventional risk assessment methods in order to adopt a comprehensive and precautionary approach that is more realistically, environmentally protective. Finally, an important lesson that federal EA can draw upon from the analysis of federal CSM practices and the case study is that the EA process should require the inclusion of project *need* in the project proposal in order to facilitate the assessment of alternatives *to* the project. Other recommended improvements for the current federal EA process are also suggested in the concluding remarks.

NEPA Modernization: How Federal Government Guidance on Climate Change Analysis Can Improve Environmental Impact (April 2016)

Author: Dana Feingold

Employer: US Council on Environmental Quality

Abstract

In the US, inadequate environmental assessments often lead to litigation and project delays. The Council on Environmental Quality (CEQ) is the federal government agency that oversees the American environmental assessment law known as the National Environmental Policy Act (NEPA). To aid in NEPA compliance, the CEQ periodically releases guidance documents clarifying certain key policy issues. These guidance documents are intended to improve the efficiency and consistency of federal environmental reviews. The CEQ has been moving slowly towards establishing guidance for consideration of climate change under NEPA since the late 1990s. The most recent draft of a CEQ guidance document addressing greenhouse gas (GHG) emissions and climate change under NEPA was released for public comment in 2014. In this paper, I provide an overview of the NEPA process and the rationale for considering GHG emissions and climate change within the NEPA framework. By examining the case of Mid States Coalition for Progress v. Surface Transportation Board, I explore how CEQ guidance on GHGs could have helped the Surface Transportation Board (STB) meet its NEPA requirements and avoid project delays. In this case, the STB was brought before the US Court of Appeals to defend its failure to consider GHG emissions in the environmental review of a coal transportation project. The court ruled that the STB must consider emissions impacts of increased coal consumption that would result from the proposed action. Many of the assumptions that predicated the STB's failure to assess the greater climate change implication of the project are addressed in the CEQ GHG guidance. I discuss how the multi-year project delay resulting from the lawsuit could have been avoided if this guidance had been available to STB at the time, and find that CEQ guidance on consideration of GHGs and climate change would have a positive impact on the NEPA process.

Coherence and Equity in the Treatment of Industrial and Water Related Projects: A Case Study in Quebec (April 2016)

Author: Emmanuelle Galeotti

Employer: Ministère du Développement Durable, de l'Environnement et de la Lutte contre les Changements Climatiques (MDDELCC)

Abstract

The Direction générale des évaluations environnementales et stratégiques (DGEES), the EIA unit within the Ministry of Environment (MOE) of the province of Quebec (MDDELCC), has for mandate the execution of the EIA process according to the section IV.1 of the chapter 1 of the Environment Quality Act. Within the DGEES, the Direction of environmental assessments of industrial and water related projects (DEEPHI) assesses and makes recommendations to the decision makers for projects whose activities are complex and very diverse.

These recommendations concern projects' impact management and translate into mitigation measures requirements deemed necessary by analysts and experts to make a project acceptable at both the environmental and human levels. The DEEPHI's supervisors must ensure that the measures required as conditions or engagements from the proponents are coherent and equitable from one project to the other.

Two aspects are addressed based on six cases studies. The first one is operational and concerns the development of a toolkit to facilitate a consistent and fair treatment of the various projects DEEPHI officers are in charge to assess. The second one is procedural and uses a comparative analysis to evaluate the coherence and the equity of the conditions and engagements required among the projects studied. The results show some inconsistencies in the way requirements are formulated and communicated by the DEEPHI, and suggest that coherence and fairness in the treatment of projects do not only depend on the assessment team's approach, but also on the resources available for the analysis and on the quality of the negotiations with the proponents.
Environmental Sensitivity Mapping: Emergency Preparation to Marine Oil Spills in the Vancouver Area (January 2016)

Author: Laura B Peterson

Employer: Environment Canada

Abstract

Environmental emergencies such as ship-sourced hydrocarbon spills can adversely impact environmental components in a marine environment. Environmental Sensitivity Mapping is a geospatial assessment method commonly used to help identify the sensitive environmental (biological, socio-economic and physical) components of a receiving area. At Environment Canada's National Environmental Emergency Centre in Montreal, sensitivity maps are a crucial output generated by environmental emergencies officers. These maps compile and present essential data for marine hydrocarbon incidents and help decision-makers design response techniques for pollutant recovery and the mitigation of negative environmental effects. A shortcoming of sensitivity mapping is related to the large amounts of geospatial data that can be compiled to produce outputs; the compilation process to determine priority areas is often complex and for the untrained user it can be difficult to quickly discern which areas are the most prone to adverse environmental effects. This report concentrates on the research and development for strategic identification of the factors that influence biological sensitivities to hydrocarbon spills in a marine environment by using a study area in southern Vancouver, British Columbia. Using strategic Environmental Sensitivity Mapping, Environmental Impact Assessment and Geographic Information Systems frameworks, a selection methodology is designed. The method produces maps of convergence areas of biological sensitivities - hot spots - that can help decision-makers prioritize areas for preparedness and response to marine environmental emergencies in Canada.

Environmental Performance Rating Systems: An Effective Tool for Increasing Compliance with the Canadian Environmental Assessment Act, 2012? (January 2016)

Author: Jonathan Ruse

Employer: Canadian Environmental Assessment Agency

Abstract

The Canadian Environmental Assessment Act, 2012 (CEAA 2012) provides regulatory authority allowing the Minister of the Environment to issue legally binding decision statements establishing conditions with which a proponent must comply. The Canadian Environmental Assessment Agency (the Agency) is currently developing a Compliance and Enforcement Program in order to promote and verify compliance with CEAA 2012 and specifically, conditions in decision statements. An Environmental Performance Rating System (EPRS) is a system where companies are rated by regulators based on their environmental performance in order to encourage improvement through public scrutiny and market incentives. This paper provides an overview of three EPRSs – the PROPER program, the GreenWatch Program, and the AKOBEN program – in order to evaluate those programs and how an EPRS might impact the Agency. Results indicate that all three programs have resulted in a significant increase in compliance resulting in effective reductions in pollutants harmful to the environment. An EPRS for CEAA 2012 could help increase transparency in the environmental assessment process and provide incentives for proponents to go beyond compliance and implement best practices in environmental management. It may also help to remedy current flaws in the pre-assessment phase, in the assessment phase, and also the post-decision phase. However, the success of such a program depends on the ability to create a fair rating scheme across a variety of projects, on taking into account other environmental legislation, and on supporting the program with a legislative base. Determining whether or not an EPRS is a viable approach to increase compliance with CEAA 2012 will ultimately depend on accurate program performance evaluation, and would therefore be more suitable as a long-term initiative, requiring the resources and input of multiple federal authorities.

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Environmental Assessment Follow-Up: Learning from the Canadian Nuclear Industry (December 2015)

Author: Lucia Abellan

Employer: Canadian Nuclear Safety Commission

Abstract

Follow-up has long been acknowledged as an important component of the Environmental Assessment (EA) process. Broadly understood as the umbrella term encompassing all postapproval EA activities, follow-up is a valuable project-management instrument with a wide-range of functions. These include improving the environmental performance of projects, identifying unforeseen impacts, verifying compliance, raising public awareness, increasing citizen participation, and ultimately, bettering future EA practice. While such benefits are widely accepted, follow-up remains a generally weak area of EA that is either poorly implemented or ignored altogether. In view of this deficiency, the present report aims to shed light on how to conduct adequate EA follow-up using a two-fold approach. First, the theory behind follow-up is described and best-practice principles from the EA literature are identified. Secondly, two case studies, drawn from the Canadian nuclear sector, are examined and potential strengths, weaknesses and areas for improvement in follow-up are highlighted. Results indicate that there is still much room for improvement with respect to how EA follow-up is conducted. Based on the Canadian nuclear sector's experience, a number of recommendations are put forward to improve follow-up in Canada. Key lessons learned call for a wider scope, more opportunities for public involvement, further consideration of local knowledge, better access to documentation, and a clearer definition of roles and responsibilities in EA follow-up.

A Case Study about Energy Consumption and Recommendations for Future Energy Conservation Plans (December 2015)

Author: Xiaojuan Li Employer: Vanier College

Abstract

Vanier College presently has a level one Cégep Vert Certification from Environment Jeunesse. The first Environmental Assessment was done five years ago. It was necessary for Vanier College to do the second Environmental Assessment after these five years in order to reach a level two environmental certification also with Environment Jeunesse. The purpose of Vanier College's second Environmental Assessment is to gauge if their institution is improving or deteriorating in terms of impact on the environment. This paper presents the situation of a case study on the energy performance of Vanier College. Factors that are influencing energy performance are: 1) the lack of efficient sensors for lighting and temperature; 2) the lack of thermal walls, which are used to pre-heat the buildings, especially in the winter months; 3) the lack of double glazing on windows, which will affect not only the room temperature, but also the indoor air quality as well. The purpose of this study is to assess the current situation of energy consumption, indoor air guality and the Life Cycle Assessment for the buildings' energy saving in Vanier College. Included in this study are the evaluation and determination existing problems, the shortage and drawbacks of actual energy usage, the absence of proper legislative measures for energy efficiency and finally, to generate suitable suggestions and recommendations depending on this current case study.

Environmental Assessment and Ship-mediated Species Introductions in Northern Canada (October 2015)

Author: Gina Senko

Employer: Office of the Auditor General

Abstract

Climate change and the associated reductions in sea ice coverage present an opportunity for increased economic development, resource extraction and greater marine access in northern regions. This opportunity raises concerns, however, as international economic activities, such as shipping, can have profound impacts on ecosystems and the societies who depend on them. Ship-mediated species invasions, in particular, have had considerable environmental, economic and social impacts around the globe. To minimize the risks associated with ship-mediated species introductions, Environmental Impact Assessments have an important role to play. Using Baffin land Iron Ore Corporation's Mary River project as a case study, this report examines the manner in which a project proponent and regulatory agencies present the risks and consequences. A review of the project along with changing ballast water regulations highlights both the potential and responsibility Environmental Assessments have in managing the threat of invasive species in northern Canada. General and project-specific recommendations propose ways in which Environmental Impact Assessment can better address and mitigate the risks and impacts associated with ship-mediated nonindigenous species introductions for the future. Those recommendations include; the consideration of upcoming regulations in the design of onboard ballast water treatment systems, impacts of treatment methods, inclusion of environmental risk assessments for predictive modeling in all phases of a project and in transboundary assessments, rigorous baseline and monitoring studies, regulatory oversight and redundancy, inclusion of hull fouling as a vector of species introductions for vessels and floating infrastructure, use of detailed variables when calculating risks of hull fouling, impacts of hull cleaning discharge, consideration of cumulative effects in phased-in project development, and the need for a clear and legally binding international regulatory framework.

Regulatory Framework and Renewable Energy Expansion in North (October 2015)

Author: Maya Kelty

Employer: Center for Resource Solutions

Abstract

Electricity is a central sector targeted in efforts to reduce greenhouse gas (GHG) emissions in the United States, with a specific focus on increasing renewable energy generation. In order to track generation and sales of electricity, a new commodity was formed – the Renewable Energy Certificate (REC) – which represents the environmental attributes associated with 1 megawatthour (MWh) of renewable energy generated. Since this time two markets for RECs have formed, both of which are important drivers of renewable energy adoption. At the same time, states have introduced a variety of policies to encourage renewable energy adoption, all of which impact RECs to varying degrees. This paper explores the overall regulatory environment within which REC markets operate and introduces Regulatory Impact Assessment (RIA) as a tool to bridge the gaps created by incongruent policies. A number of factors are identified that contribute to REC market integrity - including the degree to which policies lead to double counting of RECs, ambiguous REC definitions, and vague REC ownership. Seven of the most prominent renewable energy policies are evaluated in terms of their impacts on these identified factors. While no legislation is found to be inherently at odds with REC markets, the implementation of popular policies in certain ways can lead to unintended negative consequences on REC markets. RIA is a cost-benefits analysis tool that could be used to ensure proper consideration of the potential impacts of proposed regulation on REC markets. RIAs require that alternative policy options by considered and that a thorough cost-benefit analysis is undertaken. The cost-benefit analysis could easily incorporate impacts on REC markets and renewable energy legislation. Performing an analysis that takes into account the full regulatory landscape would make it possible to identify potential inconsistencies before a policy is implemented - preventing undue burden and negative impacts.

America: A Need for Systematic AssessmentAssessing Social Risk on the Boto Gold Exploration Project (October 2015)

Author: David Vilder

Employer: IAMGOLD Corporation

Abstract

The Environmental and Social Impact Assessment (ESIA) framework aims at predicting, managing and monitoring environmental and social impacts of a project or a policy. Resource extraction projects, though, require years and sometimes decades of exploration work. Details about project background in the ESIA are usually taken from the feasibility study, which occurs at the very end of the exploration phase. Since ESIAs are generally done so late in a project's life, they not only fail to alter project planning, but they also fail to account for environmental and social impacts that occur during exploration phase. If the environmental impacts of a mine are relatively predictable and manageable, the social impacts are much more intangible and dependent on a multitude of external factors. Environmental and Social Risk Assessments (ESRA) done in the context of project due diligence, on the other hand, are often done several times during the exploration phase. While much smaller in scope, an ESRA can help identify and manage potential impacts before the ESIA comes into play.

This case study will focus on the ESIA application to the extractive resources industry in the developing world. It illustrates the fact that the ESIA framework is not adapted to identify and manage social impacts on a mining project. Social impacts that are caused by influx, for example, can only be mitigated if identified early and monitored with an influx management plan. To be effective, such a plan needs to be implemented before the start of construction or even before the start of feasibility study during the advanced exploration phase. In some cases, project finance requires a due diligence process that involves an environmental and social risk assessment while the project is in its exploration phase. This case study, however, will conclude that the identification of social impacts was made possible because of IAMGOLD Corporation's management beliefs in the Social Licence to Operate (SLO).

Aboriginal Self-Empowerment through Joint Ownership Arrangements: A Case Study of the Cree Nation Partners and the Keeyask Generation Project (September 2015)

Author: Osman Aganagic

Employer: Canadian Environmental Assessment Agency

Abstract

This internship report seeks to determine whether joint ownership arrangements of resource projects between Aboriginal groups and industry engender meaningful participation for indigenous communities. This is accomplished through the application of Stewart and Sinclair's meaningful participation principles to an analysis of Manitoba Hydro's Keeyask Electric Generation Project. This hydroelectric project was developed through a collaborative effort between Manitoba Hydro and four Cree First Nations, operating collectively as the Keeyask Cree Nations. The two parties negotiated the terms of their relationship in the Joint Keeyask Development Agreement (JKDA), where the Aboriginal groups involved were able to secure numerous benefits and insurances, including the option of dissolving the project.

As project proponents, the responsibility of conducting consultation fell on band leadership, who strove to ensure that all community members had a voice and understood what was being agreed to. The internship report's primary conclusion is that the Keeyask Electric Generation Project demonstrates Aboriginal groups' resilience in the face of an encroaching capitalist system. The Aboriginal communities were able to derive economic benefits from the project, incorporate traditional Aboriginal knowledge into its development and negotiate provisions in their contract with Manitoba Hydro that serve to safeguard their culture from erosion. However, the provisions related to Aboriginal employment and training for other proposed projects serve to entrench the Keeyask Cree Nations deeper into mainstream Canadian society by making them reliant on natural resource exploitation for a sustained livelihood.

Lake Sturgeon and Fish Passage at Hydroelectric Dams (September 2015)

Author: Laxmi Koirala Pandit

Employer: Department of Fisheries and Oceans Canada

Abstract

Lake Sturgeon (Acipenser fulvescens) is a large bottom feeder and long lived freshwater fish species that travels long distances between spawning and suitable rearing habitat. Lake Sturgeon is found in North America. More specifically, they are well distributed in the Mississippi River drainage basin south to Alabama and Mississippi; Great Lakes and east down the St. Lawrence River; and also the Detroit River to the limits of fresh water. In the west, the species reaches Lake Winnipeg and the North and South Saskatchewan Rivers. In the north, it is found in the Hudson Bay Lowland. Historically, the species was widespread with high abundance in its range but a decline in population was observed recently. Overexploitation was a major threat in the past, but recently, habitat fragmentation and degradation have now been considered to be the current major issue. Re-establishing and re-connecting river systems has been considered as an effective and efficient technique for protection, recovery and population management. Establishing connectivity in river systems can be achieved by removing barriers or by providing effective and efficient upstream and downstream fish passage over the barriers. Removing barriers is not feasible in most cases, therefore the most suitable and desirable alternative is to reinstate the river connectivity by providing effective and efficient fish passage to native fish species. Fish locks and elevator, trapping and trucking, and fishways (fish ladders) are the most common techniques that are used to provide fish passage at a barrier. Fishways are widely used at hydroelectric facilities to provide upstram and downstream fish movement. However, successful fish passage depends on the location and design of the fishway or fish passage and the swimming performance of the fishes. Several fishways exist in the distribution range of Lake Sturgeon; however, most of these fishways were designed for salmonids and may not be efficient for the Lake Sturgeon. Due to the biological and morphological differences between salmonids and Lake Sturgeon, the fish seem to have faced difficulties to pass through the existing fishways, resulting in overall low fish passage efficiency for the Lake Sturgeon. Poorly designed fish passage with respect to Lake Sturgeon could not only affect its migration but ultimately it will affect the Lake Sturgeon population and its recovery plan by blocking its access to spawning grounds. Thus, for successful Lake Sturgeon passage, fishway designers need to consider swimming ability and behaviour of Lake Sturgeon and space requirements for the species.

Corporate Sustainability and Risk Management: An assessment of Tools to Manage Material Environmental, Social and Governance (ESG) Risks and Issues (August 2015)

Author: Nico Ahn

Employer: Bombardier Aerospace

Abstract

It is increasingly important for corporations to manage the risks they face from environmental, social and corporate governance (ESG) concerns. In our current economic and legal system, any action to reduce ESG concerns should be undertaken to primarily support either or both elements of corporate responsibility: increasing or protecting the value of the corporation to stakeholders and complying with legislation and regulations in the jurisdictions where the firm operates. A corporation should nevertheless be mindful of its stakeholders and their concerns and requirements. Understanding these concerns will help a corporation what environmental and social risks it faces and allow it to take action to reduce such ESG risks, which have the potential to undermine the business's bottom line and compliance efforts.

A variety of tools, including for example environmental impact assessments, environmental management systems and sustainability reporting exist today that can enable corporations to manage ESG risks before these turn into financial risks. This report first provides and overview of such tools, and then compares and contrasts how they can be used within a corporation.

As all sustainability tools cover different risks and address different aspects of the corporations' ESG concerns, it is important to choose an appropriate set of tools that fit the corporate risk management objectives. The report concludes by proposing the use of a ISO 31000 risk management system to frame the ESG risk management efforts of a corporation.

A Comparative Analysis of EIA and CSR: Transferable Lessons Between Two Disciplines (April 2015)

Author: Gilles Couturier Employer: Quebecor Media

Abstract

Environmental Impact Assessment (EIA) and Corporate Social Responsibility (CSR) reporting are tools to measure and disclose environmental impacts from projects and private sector activities yet both have been treated independently in the scientific literature. This thesis aims to fill this gap by comparing and contrasting the disciplines in order to find relevant transferable lessons.

This analysis reveals a number of similarities. Firstly, EIA and CSR reduce environmental and social harm while offering financial benefits to the proponents through the use of scientific methodology. Secondly, stakeholder engagement aims to give legitimacy to the processes. Finally, the success of EIA and CSR can be measured by the amount of institutional dynamics they have fostered, from internal culture change to new relationships with NGO's and increased transparency from a review process.

This thesis also highlights a number of differences. Firstly, the two differ in their approach. Projects in EIA are screened and mandated by an external party whereas CSR is voluntary. Secondly, the two are philosophically different. In EIA, impact reduction is the goal while CSR is used to reduce costs and risks. Mandating CSR spending ensures that companies invest in impact reduction even during low profit periods. Finally, EIA and CSR have operational differences. The definition of the environment used in CSR is much more restrictive than in EIA and CSR fails to evaluate long term and cumulative impacts from its activities, a fact which could be improved through government oversight. Finally, EIA must develop its monitoring practices, notably the disclosure of information to relevant parties.

Water Use Planning: Adaptive Management as a Platform for Effective Monitoring (March 2015)

Author: Colin McInerney-Lacombe Employer: BC Hydro

Abstract

Research Question: Do adaptive management strategies (Water Use Planning) provide an effective platform for project proponents (BC Hydro) to conduct monitoring studies required to satisfy Environmental Assessment Certificate commitments in BC?

The Water Use Planning (WUP) process was developed in British Columbia (BC) as a mechanism for resolving jurisdictional conflict between the BC government and Fisheries and Oceans Canada (DFO). The conflict stems from fish entrainment and mortality within BC Hydro hydroelectric facilities along major water systems in BC. The WUP process acts as an interdisciplinary consultative platform for several managerial functions in BC, including hydroelectric water use management, mitigation of fish entrainment and mortality, and monitoring environmental impacts of BC Hydro hydroelectric facilities. In BC, project environmental assessment (EA)is carried out through the issuance of an environmental assessment certificate (EAC). The EAC is issued with several commitments that the proponent must satisfy; many of these commitments require implementing monitoring studies. The WUP process provides a platform for implementing these monitoring studies. In my report, I examine Western Toad monitoring (CLBMON-58) as a case study. I perform a review of academic literature on adaptive management and environmental monitoring. I evaluate the WUP process against the academic literature on adaptive management and determine that the WUP process does constitute adaptive management. I evaluate the WUP monitoring studies against the academic literature on environmental monitoring and determine that the WUP process is conducive to environmental monitoring as it is defined in the academic literature. I argue that the WUP process characterizes an adaptive management approach that provides an effective platform for BC Hydro to conduct the monitoring studies required to satisfy EAC commitments in BC.

An Examination of Canada's Offshore Oil and Gas EIA Process: Does it Adequately Consider Effects on Marine Species? (January 2015)

Author: Ian Martin

Employer: Secretariat for the Convention on Biological Diversity

Abstract

The main objectives of the Convention on Biological Diversity (CBD) include conserving biodiversity, ensuring the sustainable use of biodiversity and the equitable sharing of the benefits arising from the use of biodiversity. One target of the Convention is to ensure that terrestrial and marine ecosystems are protected. In the case of marine ecosystems, the specific target is to reach protected area (PA) coverage of 10%. Canada has fallen some way short of this target, with approximately 1% of its marine territory under some form of protection. In light of Canada's poor record in creating marine protected areas, this report examines the role environmental assessment (EA) plays in protecting biodiversity and reducing environmental risk and damage, with a focus on the offshore oil industry. Indeed, EIA and SEA (Strategic Environmental Assessment) are recognized by the CBD as tools for avoiding and mitigating negative impacts on biodiversity, and are processes meant to promote sustainable development and resource use. Given the potential for environmental damage in the exploitation of offshore oil and gas and the looming possibility of opening the arctic to offshore production, it is important to evaluate the extent to which EA helps Canada fulfill its commitment to the CBD and promote sustainable development generally. A review of literature and an examination of EIA reports reveal that Canada's EA process is not well suited to delivering positive biodiversity outcomes, and that the tools of EIA and SEA are not used to their full potential in promoting sustainable development.

Community-led Environmental Monitoring in Eeyou Istchee: A New Approach to EIA Follow-up (January 2015)

Author: Ronald Strangway

Employer: Secretariat for the Convention on Biological Diversity

Abstract

Due to the temporal and financial limitations imposed upon EIA practitioners, follow-up monitoring often receives little attention in the EIA process. In an attempt to make projects more sustainable, and the practice of EIA more effective, robust environmental monitoring is required to inform the adaptive mitigation management process. Additionally, regional and national standards for consulting impacted communities exist to ensure local interests are recognized and accommodated within the EIA process. In order to satisfy the requirements of robust environmental monitoring, as well as fulfill consultation and accommodation standards, this report proposes the facilitation of locally-led environmental monitoring initiatives within an EIA follow-up context.

By ensuring a place for locally-led monitoring within the EIA follow-up phase, the effectiveness of mitigation management decision-making is improved through a diversification of participating epistemologies, and an improved understanding of a project's complex socio-ecological system. Mitigation management decision-making also becomes more contextually-relevant with the inclusion of local perspectives, and gains validity among impacted communities. Additionally, opportunities for cooperative partnerships and power-sharing between proponents and impacted communities emerge through the development of consultation mechanisms required for collaborative interpretation of monitoring data and information. Savings of temporal and financial resources can be realized through the leveraging of local expertise, and social acceptability of projects and environmental management programs can be enhanced, thereby making such locally-driven ventures beneficial for both proponents and communities. Drawing upon lessons learned while assisting the Voluntary Anadromous Cisco Catch Registry Program in the Cree community of Waskaganish, this report presents the voluntary registry as a case study for potential application both within and outside of the field of EIA.

The Collaborative Aspect of Environmental Assessment within the Co-Management Framework of the Northwest Territories: An Environment Canada Perspective (January 2015)

Author: Gabriel Bernard-Lacaille

Employer: Environment Canada

Abstract

The Environmental Assessment (EA) regime in the Northwest Territories (NWT) is embedded within a co-management framework. Two different frameworks exist in the NWT, one in the Mackenzie Valley that falls under the Mackenzie Valley Resource Management Act (MVRMA) and one in the Inuvialuit Settlement Region (ISR) that falls under the Inuvialuit Final Agreement (IFA). Environment Canada (EC) is a registered external party in all of the NWT EAs and provides guidance and recommendations to the co-management boards. The overarching goal of this internship report is to address the collaborative function of the co-management system. Specifically, the objective is to evaluate the degree of inclusion of EC's advice in the board's decision-making process, particularly in environmental assessment. To do so, two case studies, one in each of the regions, will be analyzed. The first case study is the Gahcho Kue Diamond Project and the second case study is the Inuvik to Tuktoyaktuk Highway. The analysis conducted for the report determines that EC provides relevant expert advice on a wide range of subjects such as water management, wildlife/bird management, spill contingencies and other construction management issues and that, for the most part, EC's outstanding issues were resolved through the environmental assessment process. This was possible because both co-management boards allow for exchange between the proponent and external reviewers before final recommendations are issued. This is beneficial for both parties as the proponent benefits from expert advice and EC is allowed to fulfill its mandate. Finally, collaboration was analyzed using themes from Armitage (2005) and it was found that the EA regime does foster collaboration.

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Adapting Cumulative Environmental Assessment to Ensure Climate Change and Greenhouse Gas Emissions are Considered in Oil Sands Assessments: A Review of Four Surface Mines in Alberta, Canada (December 2014)

Author: Arran Gregory

Employer: Office of the Auditor General

Abstract

For the last five years Canada has been under scrutiny its approach to climate change and greenhouse gas (GHG) emissions, with much attention directed at Alberta's oil sands projects. While documents such as Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners have existed since 2003, their application to environmental impact assessments (EIA) of oil sands projects has been limited. This paper suggests the incorporation of climate change and GHG emissions mitigation into the cumulative environmental assessment (CEA) portion of EIA as the impacts by the project and on the project are cumulative and interactive by their nature. The paper is presented in four sections. The first provides a discussion of CEA's origins, the benefits derived from its use, and how climate change and GHG emissions are well suited to be incorporated into CEA, while outlining the challenges that need to be surpassed in order to make the process more effective. The second reviews Canada's climate change commitments - internationally and nationally - and how oil sands projects impact the ability to meet the goals established through international conventions. The third section evaluates four surface mines EIA's which were approved between 2004 and 2011, with an additional discussion on international unconventional oil projects. The fourth section provides conclusions and recommendations for encouraging climate change considerations (CCC) and GHG emissions management of oil sands projects. Overall, the findings from the case studies indicate that oil sands proponents apply climate change documents in a random fashion. Greenhouse gas emissions management plans are not designed to meet Canada's climate change commitments but global corporate strategies instead. Beyond recommending a moratorium on oil sands development, the restructuring of CEA in order to integrate CCC and GHG emissions management specifically for oil sands projects may contribute more to meeting Canada's CCC abroad and at home.

Integrating Resilience-Based Theory and Approaches into Species at Risk Management in Canada (October 2014)

Author: Charles Cameron Employer: Office of the Auditor General

Abstract

Biodiversity is widely acknowledged as an important systems indicator. It underpins the capacity of ecosystems to adapt and continue to provide the services upon which humans depend. Resilience theory has advanced transformative concepts that can refine the management of biodiversity. This report examines Canada's effort to protect biodiversity through species at risk management, by using a resilience, systems-based approach. It builds on ideas proposed for more effective species at risk protection and recovery in the United States using the *Endangered Species Act* (ESA), and assesses the means by which the recommendations may be integrated into the Canadian equivalent *Species at Risk Act* (SARA). It argues that the integration of resilience-based approaches can improve the implementation and effectiveness of SARA by taking steps to enhance resilience by attending to a more complete systems view, acknowledging the importance of back-loop dynamics in the adaptive cycle, and by advocating for and properly using adaptive management to navigate collapse and reorganization. The emergent narrative promotes future research by using the adaptive cycle as a framework to conceptualize the Act itself.

Legislative Cooperation within Water Governance: Discovering linkages between the Ontario Environmental Assessment Act and Clean Water Act

(September 2014)

Author: Samuel Mason

Employer: Office of the Auditor General

Abstract

Since the Walkerton Tragedy of 2000, Ontario has experienced a heightened awareness to environmental health, especially concerning drinking water quality and quantity. Following recommendations from Justice Dennis O'Connor, the provincial government introduced the Clean Water Act, which establishes the development of source protection plans (SPP) throughout Ontario's most populous areas. Designed by local actors on a watershed basis, the SPPs are significant in their potential to change drinking water protection in the province. As the first of these plans gain provincial approval, there are apparent procedural linkages with the environmental impact assessment process. This paper seeks to determine what are the opportunities, advantages and challenges in reforming environmental legislation to exploit these linkages. Previous research of this subject matter has found possible advantages in collaboration between similar legislations. For this study, the Ontario's Environmental Assessment Act (EAA) and Clean Water Act (CWA) were investigated, and several procedural linkages were determined. Some of the benefits to synergizing the processes within EAA and CWA include policy efficiencies, resource savings, stakeholder cooperation, knowledge sharing, capacity building and the increased promotion of environmental sustainability. Much of the exposure to this area was gained through an internship with the Auditor General of Ontario, through working on a value-formoney audit on the Source Protections Programs Branch of the Ministry of the Environment. The audit findings are to be released in October 2014.

Application of the Ecosystem Approach to Environmental Assessment: Issues and Suggestions (August 2014)

Author: Iffat Huque Employer: Environment Canada

Abstract

Canada is committed to the application of the ecosystem approach as a management paradigm, through various policies and strategies. The ecosystem approach is defined by the Convention on Biological Diversity (CBD) as "a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way". It is guided by twelve principles which emphasize: balancing conservation and use of biodiversity, conservation of ecosystem structure and function, ecosystem services, a holistic view interrelating different temporal and spatial scales, involvement of relevant sectors of society, adaptive management and integration of best available science and local knowledge.

Environmental Assessment (EA) is potentially a powerful tool in implementing the ecosystem approach as it allows consideration of ecological consequences of, and societal choices in making decisions about local developments. This study documents the perception of environmental assessment professionals on the extent to which EAs apply the principles of the ecosystem approach, and identifies priority actions for implementation of the approach. A survey, a consultation with EA managers and investigation of six EA reports show that there are many weaknesses and hurdles in the application of the principles in EA. In the context of the ecosystem approach, EAs are found to be weakest in the assessment of impacts on ecosystem services, consideration of long term impacts and trade-offs between short term benefits and long term goals. For better implementation of the approach, emphasis should be given on Regional Environmental Assessments and developing regional baseline information to support project decisions. Priority should be given to develop guidance and training for proponents, experts and reviewers on: (i) assessing impacts on ecosystem services, (ii) defining the limits of ecosystem functioning, and (iii) assessing impacts on biodiversity.

The Right to a Healthy Environment in Canada: A case study of its Application in Pipeline Development (August 2014)

Author: Anniclaude Weiss

Employer: The David Suzuki Foundation

Abstract

Two major pipeline projects are planned for Eastern Canada in order to relieve the transportation infrastructure bottleneck occurring in Western Canada and export tar sands oil to international markets. According to some groups, these projects will increase health and environmental risks for Canadians living nearby the selected routes. This proposition, combined with the increasing number of disastrous oil transportation accidents, suggests that questioning our rights as Canadians in regards to our health and safety should be addressed in a most urgent manner. Recognizing the right to a healthy environment (R2HE) therefore becomes a meaningful discussion to be had. This report seeks to study the foundation of the R2HE and to highlight its application to pipeline development. In order to achieve this, an extensive literature review was undertaken exploring numerous sources varying from newspaper articles, to project submissions, peer-reviewed literature, and books written by R2HE experts. The theoretical foundations are explored and an examination of the relationships between the R2HE and human rights, sustainable development, and environmental justice, is undertaken. The status of the R2HE is then investigated in an international and Canadian context, and its relationship to the environmental impact assessment (EIA) process. Finally, the application of the R2HE in a pipeline development context is analyzed by exploring all key stages of pipeline development. This analysis highlights the fact that the two proposed projects for Eastern Canada greatly increase the health and environmental risks for Canadians living nearby the selected routes, most especially in the transportation phase, and that the R2HE could help protect Canadians and the environment in all stages of development. Supporting tar sands development by increasing transportation infrastructure would further discourage the recognition of the R2HE for Canadians by heightening environmental risks without appropriate compensation and protective measures. Consequently, recognizing the R2HE in Canada's constitution should therefore become a priority if protecting the health of Canadians and the environment are priorities.

Are biodiversity offset policies practically feasible? A critical analysis of Wetlands Compensatory Mitigation in the United States and the Fish Habitat Policy in Canada (August 2014)

Author: Nicolas Gosselin

Employer: Canadian Environmental Assessment Agency

Abstract

Biodiversity offsets are rapidly emerging worldwide as an important policy instrument to meet the objectives of biodiversity conversation and of economic development in tandem. They consist of measures that aim to ensure that unavoidable negative environmental impacts of development are balanced by environmental gains, with the overall goal of achieving 'no net loss' or even a 'net gain' of biodiversity. However, biodiversity offsets come with a great deal of controversy, with many proclaiming that policies and approaches which promote their use are potentially pushing the limits of both scientific knowledge and practical feasibility. This paper examines the practical feasibility of biodiversity offset policies. A critical analysis of Wetlands Compensatory Mitigation in the United States and the Fish Habitat Policy in Canada is conducted. Findings strongly indicate that for both case studies, offset programs have not been nearly fully applied and the goal of 'no net loss' is far from being achieved. Some of the main discussion and recommendation points relate to record and file keeping of offset projects, compliance and enforcement, the mitigation hierarchy, the scientific database and site selection. As part of the recommendations, the paper explores how biodiversity offsets can be in incorporated in EIAs to improve the design and delivery of both EIAs and biodiversity offsets.

Green infrastructure as framework to conserve and enhance urban biodiversity (May 2014)

Author: Valérie Tremblay-Gravel

Employer: Secretariat of the Convention on Biological Diversity

Abstract

In recent years, unprecedented migration towards cities and intensifying biodiversity losses create complex challenges and opportunities for environmental urban planning. Planning approaches that can enhance urban biodiversity are likely to benefit ecosystems and human populations. This paper explores how urbanization and biodiversity can be reconciled through the concept of green infrastructure (GI). GI refers to a green space network that supports an environmentally sound approach to the design and management of urban areas. This paper elaborates five strategies to conserve and enhance biodiversity in GI. These strategies are based on a review of best practices in urban planning and environmental management literatures and then applied to analyze a case study, Toronto's ongoing waterfront revitalization project. The analysis suggests that strategies were for the most part integrated in the project's rationale and that it contributes to the integration of biodiversity in Toronto's GI. The project engages new ideas in environmental urban planning and recognizes GI functional and experiential benefits. However, the word *biodiversity* was never mentioned throughout the project's literature, suggesting that planning *for* biodiversity is still at the early stage of its conceptualization. This paper concludes that the GI approach has great potential to address the tensions created by urbanization and biodiversity conservation.

A TEIA Agreement Between Canada and the US: Challenges and Opportunities (April 2014)

Author: Olivia Collins

Employer: Commission for Environmental Cooperation (CEC)

Abstract

In the last century, Canada and the US have coordinated their efforts and signed many bilateral agreements that help manage and reduce pollution in the border regions. Despite the successes of these agreements, many of them still fail to adequately address transboundary environmental impact assessment (TEIA), leaving large gaps in their management approach. This report attempts to determine whether it is feasible for Canada and the US to sign a TEIA agreement in the future by first looking at the legal, political and historical context of the TEIA process. Following this, two existing agreements are examined and used as models for a TEIA agreement between Canada and the US. The evidence in this report points to the need for and feasibility of a future agreement to improve transboundary environmental management.

Socio-economic Effects Assessment and Follow-up: Implementation and Monitoring of Mitigation Measures (April 2014)

Author: Erik Pit

Employer: Assessment and Abandoned Mines, Government of Yukon

Abstract

My internship at Assessment and Abandoned Mines (AAM) provided me with valuable experience in working in the field of Environmental Assessment. Among my responsibilities at AAM, I was required to develop a plan for the monitoring and implementation of socio-economic mitigation measures, which will apply to the mine remediation projects for which AAM is the proponent. This task presented me with an excellent opportunity to develop my case study for this internship report.

The literature review portion of this report discusses socio-economic effects assessment including compliance and enforcement, implementation of mitigation measures, and follow-up activities. Social, cultural, and economic components of society are often some of the most important to consider in the assessment process as adverse effects upon these components can reduce the intended benefits of the project (i.e. the need/purpose of the project) thereby undermining its viability (UNEP ,2002b). Socio-economic effects assessment is often focused on the effectiveness and accuracy of predicting impacts; however, increased emphasis should also be applied in preventing impacts through the implementation of mitigation and management measures (Sánchez & Gallardo, 2005; Noble & Storey, 2005).

The Socio-economic Mitigation and Management Plan guide presented in this report was written to assist AAM in developing a management plan which will help ensure that socio-economic mitigation measures are implemented and to verify that those measures are effective.

Social Acceptability: Its Role in Environmental Assessment and its Impact on the Nuclear Industry in Canada (April 2014)

Author: Mary Jane Court

Employer: Canadian Nuclear Safety Commission

Abstract

The Canadian nuclear industry has faced social acceptability challenges since the 1950s. Social impact assessment (SIA) is a form of environmental assessment (EA) that focuses on evaluating potential social, economic and cultural impacts from proposed projects, practices and programs. SIA has been suggested to be a best practice tool to assess the true impacts of development projects. While SIA is present in Canada at lower levels, there is however a need for its inclusion at the Federal level. Meanwhile, as nuclear waste is one of the main problems associated with nuclear energy in Canada and across the world, proposed projects to manage nuclear waste require social acceptability and in turn adequate SIA assessment prior to approval. This report examines SIA best practice, nuclear projects that have been proposed in Canada, the EA processes that ensued, progress made, and areas of possible improvement.

An Environmental and Economic Assessment of Commercial Microalgal Biofuel Production in Open Ponds (April 2014)

Author: Ardeshir Vafadari

Employer: Secretariat of the Convention on Biological Diversity

Abstract

In recent years, microalgae have attracted much attention as a new and promising source of biofuel. This paper analyzes the environmental and economic implications of biofuel production from microalgae grown in large scale open ponds. This is done through an extensive and analytical review of the available scientific literature, and by applying the findings to a case study: a commercial microalgae cultivation plant located in the province of Bushehr, Iran. The key factors that affect the environmental and economic performance of microalgal biofuel production are the lipid content and the growth rate of the microalgae, the harvesting and oil extraction methods, and the source of water and CO² input. Most studies show that, environmentally, microalgal diesel compares favorably to conventional diesel and other energy crops. However, only a few of the reviewed studies estimate that microalgal fuels are economically competitive with conventional fuels. The case study was found to be using efficient technology, suitable and low impact inputs and a very potent microalgae strain. Consistent with the literature, the use of efficient methods and appropriate inputs have significantly reduced the potential environmental impacts of the case study. These factors alongside the highly suitable location, where the case study is situated in, are expected to result in a very economical production process (relative to other projects found in the literature). Nevertheless, monitoring and follow up are essential for the case study to ensure the effectiveness of the mitigation measures that are in place (such as the water filtration system). Overall, the literature review and the case study confirm the potential of microalgal biofuels, subject to the use of energy efficient cultivation methods, low impact inputs and high capacity microalgae strains.

Ecological Impact Assessment: An Analysis of Information Deficiencies in Wildlife Assessments for Migratory Bird Species in Saskatchewan (January 2014)

Author: Jason Bueckert

Employer: Bird Studies Canada

Abstract

This paper relates my internship in ecological field data collection with Bird Studies Canada to the study of ecological impact assessments. More specifically, government regulations and standardized methodologies that apply to migratory birds are used to analyze an environmental impact assessment for a project in Saskatchewan. In Canada, protection for migratory bird species and species at risk is provided through legislation, management planning, and thorough ecological impact assessments for new development. Government guidelines are available to enable and promote sustainable development. However, sustainable development can only be accomplished with enforceable legislations that support those ambitions. Guidelines and survey standards and effort are lacking because they are not mandatory and inadequately enforced. Furthermore, when an information deficiency exists, risk and impact significance is insufficiently assessed. The case analyzed in this paper exemplifies some of these common problems with ecological impact assessment. This paper demonstrates the need to implement rigorous standardized monitoring to adequately assess risk to wildlife and ensure more sustainable development.

Wildlife Species as Valued Ecosystem Components: Examining the Use and Effectiveness of the Yellow Rail as an Indicator in EIA (January 2014)

Author: Matthias Bieber

Employer: Bird Studies Canada

Abstract

Scoping is used in environmental impact assessment (EIA) to direct an assessment toward the most important issues and parameters. Valued ecosystem components (VECs) are aspects of the environment considered important from various viewpoints. In ecological assessment, these are often particular wildlife species to focus the monitoring efforts of costly field studies. Various criteria are used to select wildlife VECs including conservation status, population and habitat health indicators, socio-economic and ecological importance and umbrella species. There is no one prevailing VEC selection criterion; rather a complementary combination of case-appropriate VEC criteria and species should be considered and these should be should be easily and reliably monitored, well-studied and have suitable ecological attributes for their given role. During my internship with Bird Studies Canada, I participated in follow-up monitoring for the Fishing Lake conveyance channel in Saskatchewan, which is directed toward the assessment of project impacts on the yellow rail, a sensitive and federally listed species requiring specific wetland habitat. This paper investigates the use of wildlife VECs in EIA and analyzes the effectiveness of the yellow rail as a VEC by examining three EIAs from Alberta and Saskatchewan in which yellow rails are used as VECs. Each assessment was evaluated based on the criteria used to select wildlife VECs and the yellow rail survey methods, impact prediction and mitigation measures utilized.

It was determined that the examined EIAs used diverse sets of criteria to select wildlife VECs but did not conduct adequate yellow rail monitoring. The results show that yellow rails are not particularly well-suited as either health indicators or umbrella species due to existing knowledge gaps and unsuitable ecological characteristics. In conclusion the yellow rail may be an effective VEC as an indicator of graminoid wetland habitat health if appropriate monitoring tools are utilized, but should be used in conjunction with other wetland-associated species to represent a diversity of wetland habitats.

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What Happened to the Dolphins in North Lantau waters, Hong Kong? A Spatiotemporal Analysis of Cumulative Impacts on Dolphin Populations (January 2014)

Author: Danielle Marcotte

Employer: Hong Kong Dolphin Conservation Society

Abstract

Indo-Pacific humpback dolphins have historically inhabited the northern waters off Lantau Island, Hong Kong; however their numbers have been significantly decreasing over the past decade, while human pressure is simultaneously increasing. Based on a rigorous and critical use of a Geographic Information System (GIS), this study aims to assess the cumulative human impacts on this dolphin population since 1996. Discussed in the first sections of this paper are the multiple approaches, difficulties, and limitations to cumulative effects assessment (CEA) methodology. The following sections outline our proposed CEA methodology, which involves analysis and mapping of anthropogenic marine impacts throughout space and time in relation with historical dolphin distributions in the area. Local scale results show evidence of a relationship between the implementation of new high-speed ferry (HSF) routes and the decrease in dolphins near the Brothers Islands. Despite certain approximations in our methodology – like in any GIS based CEA model - our findings shine new light on the understanding of cumulative impacts on cetacean populations and suggest that the increasing level of HSF traffic is a likely contributing factor to the decreasing dolphin abundance in North Lantau. Using Environmental Assessment to Promote Biodiversity Conservation in Canadian National Parks: Opportunities and Challenges (January 2014)

Author: Samantha Sabo

Employer: National Capital Commission

Abstract

Widespread biodiversity loss has occurred worldwide as a result of increasing development pressures. Protected areas management and environmental assessment are two sustainable development strategies that aim to conserve biodiversity and minimize impacts to the environment. The present paper will examine how the use of environmental assessment has and can be used as a tool to support the conservation of biodiversity in protected areas in Canada, with a particular focus on national parks. The analysis identifies that many steps of the protected areas management and environmental assessment process are complementary, and that their integration will lead to better biodiversity conservation outcomes. Using a case study of Gatineau Park in Gatineau, Quebec, the integration of environmental assessment and protected areas management is examined in practice. The paper makes several recommendations that will aid in the conservation of biodiversity through a collaborative approach between protected areas management and environmental assessment. Strengthening the environmental assessment requirements for projects located near protected areas, that share a watershed with a protected area, or that are located in important ecological corridors between protected areas is necessary. Cumulative effects assessments need to better evaluate transboundary impacts to protected areas. A standardized mechanism for the sharing of baseline biodiversity data needs to be created in order to better inform conservation and environmental assessment studies. Finally, a shift in the recognition of the importance of biodiversity is required at the national level in order to create policies that promote a conservation ethic across Canada.

Additional Challenges to Meaningful Aboriginal Consultation in the Context of Large-Scale Resource Projects and Outstanding Aboriginal Claims: A Case Study of the Northern Gateway Pipeline Project (January 2014)

Author: Élyse Maisonneuve

Employer: Canadian Environmental Assessment Agency

Abstract

The Duty to Consult (DtC) is based on the judicial interpretation of section 35 of the Constitution Act of 1982 that recognizes and affirms Aboriginal and treaty rights of the Aboriginal peoples of Canada. The DtC with Aboriginal peoples arises when the Crown contemplates conduct that may adversely impact potential or established Aboriginal or treaty rights. This paper argues that fulfilling the DtC with Aboriginal peoples is especially challenging in the context of large and complex projects because of the time required to consult meaningfully. In British Columbia, where there is a lack of clarity surrounding Aboriginal rights due to outstanding aboriginal claims, the challenge of fulfilling the DtC is compounded. A critique of current governmental practices concerned with fulfilling the DtC, and based on relevant academic literature, is presented, and then applied to the case of the Northern Gateway Pipeline (NGP) project. My findings indicate that the NGP is much larger in size and complexity and also affects a significantly larger number of Aboriginal groups compared to previous pipeline projects reviewed by the Agency. Three main recommendations to improve the current situation are provided: 1) that additional time and resources be invested in Aboriginal consultation; 2) that the BC Treaty Commission (BCTC) must be substantially changed to create the proper avenue for fair treaties and reconciliation; and 3) government communication with Aboriginal groups be improved, specifically, sharing information and engaging in open and transparent discussions about asserted rights and strength of claims.

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Can Federal Legislation and Policy Improve the Practice of Cumulative Environmental Effects Assessment in Canada? (December 2013)

Author: Natasha Anderson

Employer: Canadian Environmental Assessment Agency

Abstract

According to the Canadian Environmental Assessment Agency (the Agency), Environmental Assessment (EA) is a process which predicts and mitigates adverse environmental effects of development projects in support of sustainable development. Cumulative Environmental Effects Assessment (CEA) is a component of EA that assesses the environmental effects of a development proposal in combination with other physical activities. Some have argued that CEA is the most important aspect of EA, because all environmental effects are inherently cumulative. The practice of CEA in Canada has faced rampant criticism from academics and practitioners since its conception in the late 1970's. In 2011, the Office of the Auditor General of Canada recommended that the Agency update its policy guidance for assessing cumulative environmental effects. With the coming into force of the Canadian Environmental Assessment Act, 2012 and based on the recommendations from the Office of the Auditor General of Canada, the Agency released a new Operational Policy Statement (OPS) for CEA in May 2013. This report examines whether this recent federal legislation and policy has the potential to improve the practice of CEA at the project level in Canada. The investigation reveals that the new policy and legislation is likely to have a positive impact regarding how the CEA is carried out at the project level in Canada. However positive the benefits of improving the CEA, it remains to be seen whether this would alter ultimate development decisions.

An Evaluation of Recovery Planning under Species at Risk Act (December 2013)

Author: Anila Tahiri

Employer: Office of the Auditor General

Abstract

The Species at Risk Act (SARA), was created to help the federal government meet its commitments under the Convention on Biological Diversity and under the 1996 Accord for the Protection of Species at Risk. There has been much public scrutiny as to the effectiveness of SARA, and to the capacity of federal organizations in meeting their obligations under the Act in publishing recovery documents within established timelines. The purpose of this study is to determine whether Environment Canada (EC) as the department responsible for the overall administration of SARA is complying with the Act in preparing timely recovery strategies, action plans and management plans, as well as identify what the associated time delays have been. The results indicate that by the end of December 2012, EC had managed to prepare recovery strategies for only 34% of the species under its custody, while failing to prepare timely recovery strategies for the other 66% of the species. Approximately 62% of the recovery strategies were finalized at least 2 years or more past the deadline. EC was lagging behind also in preparing timely management plans and action plans with a finalization rate of 23% and 10% respectively. It was concluded that EC was not complying with SARA in preparing recovery documents within prescribed timelines. The backlog inherited with the enactment of SARA, a lack of financial and human resources, lack of political will and a lack of clear policy and guidance documents were considered as the roadblocks to the effective implementation of SARA.
EIA and Green Technology Development: An analysis of EIA Effects on Green Technology Emergence in New Markets (November 2013)

Author: Karolina Apland

Employer: Terragon Environmental Technologies Inc.

Abstract

Environmental impact assessment (EIA) is a means to forecast and evaluate the biophysical and social effects of a project on the environment. From its origins in the 1970 US National Environmental Policy Act (NEPA) it has grown into an internationally practiced environmental management tool. Logically, EIA should serve as a tool that supports the development of greentechnologies since the immediate aim of EIA is to move society toward more sustainable project development practices and green technologies are a means to reach that end. However, the role of EIA in green technology development has not been analyzed to date. This paper provides the case study of a new green-technology, Terragon's Micro auto gasification system, MAGS™, developed for the on-site treatment of waste with energy recovery in the form of hot water. Terragon's attempt to break into Quebec's biomedical waste treatment market has been met with bureaucratic red tape. The biomedical waste market can currently be characterized as being oligarchic in nature, plaqued with high waste treatment costs and dominated by large-scale incinerators. MAGS is a potential solution to these common biomedical waste treatment issues. Using a framework published by the International Association of Impact Assessment, the procedural substantive and transactive weaknesses present in Quebec's EIA process are uncovered in the context of green-technology development. A solution in the form of technology assessment over environmental impact assessment to study the environmental effects of new technologies is suggested to correct the current problems associated with EIA procedures in Quebec.

Investigating the Environmental Impacts of Bioremediation : A Life-Cycle Assessment of the Remediation of a Decommissioned Fossil Fuel Processing Facility (September 2013)

Author: Patrick Marcoux

Employer: Stantec Inc.

Abstract

Environmental remediation strategy is traditionally developed according to regulatory and economic criteria, with limited consideration of the impacts the remediation process may have on the environment itself. In the present study, the secondary impacts of soil remediation are evaluated using a Life Cycle Assessment-based evaluation tool, and are contrasted with the observed effects of biopile-based rehabilitation. An LCA was performed using an open source modeling program, openLCA, in order to estimate the impacts of resource investment required for the first remediation of a decommissioned oil processing facility. The resource inputs considered include diesel fuel, electricity, and chemical amendments (NPK). The resulting Life Cycle Impact Assessment inventory indicates that the principle outputs include CO2 (4.4kt), N2O (21.6kg), CH4 (10.0kg), CO (980.3kg), (NOX) 4700kg, SOX (978.0kg) and unspecified particulates (195.5kg). The associated impact categories include significant increases in Global Warming Potential, Human Toxicity Potential and Acidification Potential. LCA results were compared to overall bioremediation performance during the first phase of treatment, which indicated an approximate contamination decrease of 60% over 12 weeks. Average rates of contaminant breakdown were 60.6 mg/kg•day and 3.1 mg/kg•day for TPH and PAH compounds, respectively. Preliminary assessment of associated risks suggests that secondary impacts of remediation activities are much less significant than the potential impact of a zero-action plan, wherein existing contaminants would be left in place on the site. Onsite evidence indicates the strong possibility of groundwater and eventual surface water receptor concentration if soil decontamination is not completed. The impacts of bioremediation stated in the LCA do not pose a risk of acute harm to human or environmental health, but rather are shown to be contributors to ongoing chronic impacts to global systems. As the scope of environmental impact assessment generally does not extend beyond the primary impacts of remediation, damages generated from the secondary impacts are not taken into account in EA. In the current case, local environmental integrity was privileged over contamination released into the atmosphere. A carbon credit system could potentially reduce secondary impact generation with minimal added cost towards responsible authorities and corporate entities.

Regional Environmental Assessments and Aboriginal Participation - A Case Study Analysis of the Lower Athabasca Regional Plan (August 2013)

Author: Heather Rasmussen

Employer: Transport Canada

Abstract

The Supreme Court of Canada ruled in 2004 and 2005 that the Crown has a constitutional 'duty to consult and, where appropriate, accommodate' Aboriginal people if an action has the potential to negatively impact potential or established Aboriginal or treaty rights. The predominant tool the Crown uses to consult is Environmental Impact Assessment (EIA). Many Aboriginal people, groups and communities, as well as non-Aboriginal Canadians, EIA practitioners and academics, have criticized the role of Aboriginal people in decision-making processes at the project level and the ability of EIA processes to protect Aboriginal and treaty rights. Other limitations of project level EIA are argued to include deficiencies in mitigation and follow-up measures as well as inadequacies of cumulative effects assessment. Regional Strategic Environmental Assessment (RSEA) is increasingly used to assess cumulative effects at a regional level and as a tool for landuse planning. While government and academic literature exists on the use and benefits of RSEA, this is predominantly process based and there is little detail on Aboriginal participation. The focus of this report is to analyze the potential of an RSEA approach to address identified barriers to the meaningful participation of Aboriginal people in the Canadian EIA process at the project level and to analyze and exemplify through a case study analysis how and potentially why such an approach can fail at this. The potential barriers are identified through a comprehensive literature review and are analyzed using a framework developed by Kieran O'Faircheallaigh and relate to: the goals, purposes and mandates facilitating Aboriginal participation; the structures regarding decisionmaking; the financial resources made available for potential participants; the (in)ability to gain and share expertise and knowledge; the processes used to facilitate participation; and the recognition and standing given to the importance of Aboriginal participation and legitimacy of their concerns. An in-depth analysis of the Lower Athabasca Regional Plan in North Eastern Alberta, which uses an RSEA approach and fails to address these potential barriers, is conducted using the above framework. As the use of RSEAs in Canada is increasing, such an approach can be used to facilitate double loop learning, or learning from 'past mistakes'. Recommendations are made to the federal government regarding the processes used for Aboriginal participation in RSEA as well as the transparency of such processes.

Review of the Legal Framework and Environmental Assessment Process for the Salmon Industry in Canada (August 2013)

Author: Edwin Correa Arce

Employer: Secretariat of the Convention on Biological Diversity

Abstract

This paper shows an overview of the regulatory framework in the salmon aquaculture industry and a comparative study with Norway that highlights the complexity of the process of establishing a new development and explains in part the stagnation of Canadian aquaculture in general.

Recent changes in basic regulations such as the Fisheries Act and the Canadian Environmental Assessment Act (2012) have created uncertainty about the future consequences on salmon farming sustainability. It is unclear how the elimination of aquaculture projects from the list of designated projects requiring EIA under the new CEAA altogether with controversial changes in the Fisheries Act will affect the salmon industry.

The creation of an Aquaculture Act is expected to consolidate these regulatory gaps, but there has been little public consultation. When compared with Norway, Canada needs to improve performance in areas such as the effectiveness of authorization systems, fish movement including GMO salmon, and food safety pointing out how some provinces have better structured regulations for aquaculture. It is urgent for the salmon farming industry to design a sound environmental framework including an SEA or some sort of management plan for water bodies.

A Better Approach to Outcomes Statements for EA at Environment Canada (July 2013)

Author: Alex Pinheiro Employer: Environment Canada

Abstract

Over the last decade strategies for environmental management have been substantially changed by reforms that mandate more self-regulation by proponents. These changes, emphasizing speeding up the process, will necessarily diminish rigor if the EIA cost is not increased, and thus any strategy that represents a reasonable compromise between these two goals has great value. Environment Canada staff at the Environment Protection and Operations Directorate (EPOD) are in the process of developing Outcomes Statements for EA. When completed, these statements should function as a set of performance expectations that proponents will adhere to, and are agreed upon during the EA process. While this may be a worthy endeavour, it has yet to be shown whether or not Outcomes Statements can deliver on these promises. As of the end of 2011 they are not fully developed, tend to be mismanaged, and are poorly understood by EPOD staff. Rather than provide a cohesive way forward, they are a point of disagreement and are subject to unrealistic expectations. This paper will examine the different views of EPOD staff members on the development and employment of Outcomes Statements, point out problems both with the policy and within the department, as well as identify the best way to proceed with the strategy of proponent-led assessments.

Strategic Consultation: Strategic Environmental Assessment as Tool for Meaningful Aboriginal Consultation (April 2013)

Author: Adam Levine

Employer: Infrastructure Canada

Abstract

The Crown's (federal and provincial governments) duty to consult Aboriginal groups is founded in Section 35 of the Canadian Constitution Act 1982, which recognized and affirmed both Aboriginal and Treaty rights. Subsequently the Supreme Court of Canada (SCC) has provided greater clarity on what the duty means in practical terms for the Government of Canada. The SCC has indicated that the Crown must consult and potentially accommodate Aboriginal groups when Crown conduct may have an adverse impact on potential or established Aboriginal and/or Treaty rights. Aboriginal consultation (AC) is most often conducted at the project level, commonly in conjunction with an environmental assessment (EA). Project consultations through project-EAs have a limited scope and often fall short of addressing the concerns of affected Aboriginal groups meaningfully. The shortcomings of project level consultations can potentially lead to frustrations among affected groups and has at times led to conflict. This paper argues that Aboriginal consultation is better suited for the strategic planning level of government and explores the possibility of using strategic environmental assessment (SEA) as a potential mechanism for the meaningful consultation of Aboriginal groups. In order to explore the potential for strategic consultations through SEA, a thorough literature review was conducted. It was discovered that strategic consultations could help address many of the identified limitations of project level consultations; however, the present SEA framework in Canada has a number of limitations of its own that prohibit it from being an effective mechanism for meaningful AC at this time. Two case studies were examined to demonstrate practical examples of the benefits of strategic consultations in the Canadian context. Furthermore, in order to compliment the literature review and case studies examined, a qualitative questionnaire was provided to volunteer federal government employees in order to ascertain their expert opinion and insight on the viability of consulting Aboriginal groups at the strategic level through SEA. The responses from the questionnaire are integrated in the discussion of the paper and informed potential solutions to address the identified limitations of SEA as currently practiced in Canada. Future directions for research on the practical application of strategic consultations were also explored.

Strategic Environmental Assessment as a Tool for Supporting Resilience in Social-ecological Systems (April 2013)

Author: Kimberly Milligan

Employer: Secretariat of the United Nations Convention on Biological Diversity

Abstract

Strategic environmental assessment (SEA) is a sustainability-focused practice that assesses the potential impacts of policies, plans, and programs. This paper argues that SEA is a highly suitable approach for supporting resilience in social-ecological systems. To support this argument, the aspects of resilience thinking to which SEA is particularly complementary are explored. First, the potential of SEA to address complex adaptive systems and social-ecological systems is assessed. Second, the ability of SEA to promote the resilience of social-ecological systems through good governance is explored. Third, the extent to which SEA can incorporate key principles of adaptive management is considered. Three case-studies are examined to identify practical examples of the ability of SEA to support resilience in social-ecological systems. My findings indicate that despite theoretical support for the potential of SEA to address resilience, there has been limited success in this regard in practice. This is a field that has received little attention until very recently, despite its potential to contribute to the protection of increasingly sensitive global social-ecological systems. Ways in which this can be remedied are considered, including future directions for the SEA community.

A Proposed Three Step Process to Strategic Sustainability for Canadian Hospitals: Case Study of the Montreal Jewish General Hospital (April 2013)

Author: Chantal Forgues

Employer: Montreal Jewish General Hospital

Abstract

Hospitals have significant negative environmental impacts that not only affect the physical environment but ironically human health as well. This paper analyses a proposed three step process to environmental sustainability as a solution to decrease the environmental impacts of hospitals in the most effective way. This report details out the main impact areas of Canadian hospitals and some of the individual projects that have been implemented to mitigate some of the negative effects of each impact area. The main incentives for these sustainability projects currently stem from governmental regulation, healthcare association support, and the potential for cost savings.

The paper builds off of a baseline assessment conducted as part of an internship position at JGH. The three step process is designed to progress away from the current status of individual sustainability projects to a more effective system of an overall sustainability strategy. The three step process includes conducting a baseline study, developing an environmental management system from the opportunities and gaps from the baseline data, and developing a sustainability plan from the processes developed by the environmental management system. In order to successfully implement a sustainability plan at JGH and receive approval from upper administration, a multi-stakeholder green team should be implemented at the hospital and all proposed projects within this plan should be linked to the hospital's business plan.

Health Impact Assessment: Identifying Challenges and Exploring the Potential Role of the UN Convention on Biological Diversity in Overcoming Them

(April 2013)

Author: Jennifer Garard

Employer: Secretariat of the United Nations Convention on Biological Diversity

Abstract

Health impact assessments (HIA's) are a tool increasingly recognized and used to assess the impacts of policies, programs and projects on human health outcomes. However, HIA's are not as widely used as other forms of impact assessment and there are unique obstacles to their development. This report explores the history and current best practices in HIA as well as challenges facing its use. Challenges were organized into three major categories: a disconnect between the health and environment sectors, the question of whether HIA should be integrated with other forms of assessment, and issues with specific steps in the HIA process. The potential of the Health and Biodiversity Cross-Cutting Initiative at the Convention on Biological Diversity (CBD) to help overcome these challenges was discussed. Furthermore, since learning is a documented outcome of HIA, this report also explored the possibility that the CBD could even benefit from directly promoting HIA. Suggestions for how this could be done are provided, including integrating HIA into workshops, publications and high-level meetings. The case study of the Ekati diamond mine in Northwest Territories, Canada demonstrates the HIA best practices and challenges determined from the literature in a real-life setting, as well as emphasizing the potential role of the CBD in advancing HIA practice.

Lessons from a Baseline Study of a Garry Oak Ecosystem for Environmental Impact Assessment in the Face of Biodiversity Loss and Climate Change (April 2013)

Author: Undiné Celeste Thompson Employer: Galiano Conservancy Association

Abstract

This report is based on a systematic baseline assessment of Retreat Island, an almost three hectare (seven acre) area near Galiano Island, British Columbia, that is covered with plants from the coastal Douglas fir biogeoclimatic zone and its sub-communities of the environmentally and socially significant Garry oak meadows. Garry oak ecosystems are important within a variety of areas of interest within environmental assessment, including climate change, biodiversity and coping with biodiversity loss, and ecosystem modelling. Garry oak ecosystems are of particular interest because of their predicted positive responses to climate change, but only if the biological diversity of these ecosystems is maintained. This is poignant given that one of the predicted consequences of climate change is significant biodiversity loss. The issues of climate change and biodiversity loss pose distinct challenges to the process of environmental impact assessment (EIA). In order to better incorporate climate change and biodiversity loss into EIA, many researchers cite adaptive management as a key tool. This report uses adaptive management theory, ecosystem theory, and risk society theory to look at the baseline study of an island ecosystem and to also look at the concept of valued ecosystem types such as Garry oaks and the need for their incorporation into the environmental process. It then discusses the importance of these baseline reports as well as the challenges that exist when creating a baseline study. The Garry oak baseline study is then looked at for the possible lessons that we can learn from for the improvement of EIA and our adaptation to climate change.

The Importance of the Science-policy Interface in the PPP Decision-making Process (March 2013)

Author: Erika Sulik Employer: Ecologic Institute

Abstract

Strategic environmental assessment (SEA) was developed so as to help inform policy decisions in an effort to produce better decision-making choices. It was long assumed that decision-making followed a rational scheme whereby the provision of better information (good scientific evidence) would lead to better decisions. The process of decision-making, however, is not so simple. In order to determine some of the limitations to present day SEA practices, various decision-making theories were examined, as well as the differences that exist between scientists and policymakers which often inhibit their ability to effectively work together. A recent European project, the LIAISE (Linking Impact Assessment Instruments to Sustainability Expertise) Network of Excellence, was then evaluated in order to determine how effective such a network is at bridging the science-policy divide. The results from the analysis are then used to demonstrate how networks such as LIAISE could aid in integrating SEA within the PPP-and decision-making processes. This paper suggests that if real progress is to be made in integrating SEA into decision-making, the science and policy professionals, along with consultants, planners and other stakeholders, will need to develop a shared understanding of what constitutes quality SEA. Along with this shared understanding, researchers and decision-makers must agree on the overall objectives of SEA, and the criteria to be used to determine whether these have been achieved. Only once this has been accomplished can the two groups work together to determine which methodologies would be best suited to attaining their shared goals.

Environmental Assessment as a Blockade to Aboriginal Cultural Loss: an Examination of Cultural Erosion from the New Prosperity Gold-Copper Mine Project (January 2013)

Author: Jason Patchell

Employer: Canadian Environmental Assessment Agency

Abstract

Resource developments that occur near traditional Aboriginal territories have had overwhelmingly negative effects on the culture of Aboriginal peoples. This paper examines the potential environmental effects of mining from the proposed New-Prosperity Gold-Copper Mine Project and how they degrade the culture of the Tsilhqot'in Nation in the Cariboo-Chilcotin region of British Columbia. As these effects act cumulatively with impacts from the past, present, and future, the cumulative effects gradually erode culture further. Without acknowledging and addressing this issue, the result may be complete local devastation of an Aboriginal culture. This paper suggests that the Canadian Environmental Assessment Agency has the power to, and must, prevent further losses to Aboriginal culture in Canada, and recommendations have been made that may be adopted by the Agency in order to prevent continued cultural loss.

Aboriginal Consultation: Using the Canadian Environmental Assessment Agency to Fulfill the Crown's Duty to Consult (January 2013)

Author: Brenna Belland

Employer: Canadian Environmental Assessment Agency

Abstract

In 2007, the Canadian Environmental Assessment Agency was mandated to be the Crown Consultation Co-ordinator (CCC) for all federal environmental assessments (EA), in order to fulfill the Crown's Duty to Consult with Aboriginal groups. The Crown's legal duty to consult arises when it becomes aware of any Crown project or activity that may have potential adverse impacts to an Aboriginal group's asserted or established Aboriginal or Treaty rights. To the extent possible, the Aboriginal/Crown consultation process is now integrated into the EA process. My report aims to provide an overview of the legal and policy context from which the Duty to Consult emanates, as well as to highlight some key issues that may occur during the consultation process. Using the Northern Gateway Pipeline (NGP) project as a case study. I argue that Aboriginal consultation is a very complex process, particularly when carried out by an independent advisory body such as the Joint Review Panel (JRP). As a result most Aboriginal groups are required to use limited financial resources to hire outside consultants and/or lawyers. Using submissions from some of the Aboriginal groups contributing evidence to the JRP process, I argue that many lack the necessary funding and capacity to participate meaningfully in the consultation process. While funding is provided to groups on a project to project basis, many groups lack the capacity within their own communities to adequately participate in the JRP process. If Aboriginal groups are to participate meaningfully in EAs, communities need capacity building and infrastructure to support their participation.

Availability and Usefulness of Impact Assessment Toolboxes (January 2013)

Author: Terri Kafyeke

Employer: Ecologic Institute (Berlin, Germany)

Abstract

The world of policy is faced today with two conflicting realities: an increasing desire to base decisions on evidence, and reluctance to use the tools designed for this very purpose. LIAISE (Linking Impact Assessment Instruments and Sustainability Expertise) - an EU-funded network of excellence which I evaluated during my internship in Berlin - aims to bridge this gap by creating an impact assessment (IA) toolbox. Several other IA toolboxes already exist, and I selected two of them to determine to what extent they may solve current issues in impact assessment. To do so, I developed a logic model of an "ideal toolbox", derived a set of indicators and evaluated as many indicators as possible (based on temporal resources and confidentiality issues) for both toolboxes. I determined that both toolboxes provided much useful resources for policy-makers, but fell short of creating a real interface between science and policy. Nonetheless, it appears that toolboxes have the potential to solve many recurring problems in the field of EIA.

How Impact Benefit Agreements are affecting the Environmental Assessment process (January 2013)

Author: Catherine Gieysztor Employer: Infrastructure Canada

Abstract

Aboriginal Consultation is increasingly a requirement within the Environmental Assessment process, especially since the Supreme Court established the Duty to Consult (DtC) Aboriginal peoples as a legal requirement when the Crown contemplates conduct that could potentially have adverse impacts on their rights. An initial review of the literature identifies weaknesses of how aboriginal consultation is handled within the EA process as well as strengths and weaknesses of Impact Benefit Agreements (IBAs). It suggests that IBAs could provide an opportunity for Aboriginal communities to gain more from the development of their traditional lands as well as compensating them for potential negative impacts; however, this is not consistently the result. This analysis is then used to assess the Northwest Transmission Line (NTL) case study to examine how the EA process was affected by IBAs. One of the main advantages of the IBAs was the provision of adequate funding to each affected Aboriginal community to support their engagement in meaningful reviews of the various EA documents. This also allowed the regulatory requirements, such as the completion of the EA itself and the DtC, to be met. The IBAs agreed upon after the regulatory approvals also provided a good mechanism for clarifications and confirmations of previously agreed upon commitments although this cannot be confirmed due to the confidential nature of the agreements. It is too early to judge the long-term effects of IBAs; whether the ultimate winners of these agreements will be aboriginal communities or nonrenewable resource development corporations has yet to be determined. Maintaining a close watch on their evolution may however help steer them in a positive direction, where all parties may hopefully obtain net benefits.

Mainstreaming the Biodiversity-Health Nexus in Policy-Making: An Ecohealth Approach to Strategic Environmental Assessments (January 2013)

Author: Cristina Maria Romanelli

Employer: Secretariat of the United Nations Convention on Biological Diversity

Abstract

This paper will examine the urgent need and complex task of mainstreaming biodiversity and human health considerations into national and regional policies and integrating them in the early stages of decision-making by incorporating them in strategic planning processes such as Strategic Environmental Assessments (SEAs). It argues that the combined consideration of the under-valued intersections between biodiversity and health issues – known otherwise as the "biodiversity and health nexus" -- must be incorporated systematically in policy development. This integrative approach supersedes the more common action of merely relegating these issues to isolated projects that consider only options derived from project-based Environmental Impact Assessments (EIAs) or Health Impact Assessments. In recent years, the links between the promotion of human health and the conservation of biodiversity have been made in different contexts whether it be through scholarly works, through the World Health Organization (WHO) and other international organizations, or select national policies, plans or programmes. However, national policies and the SEAs on which they are sometimes based rarely explicitly or systematically recognize or reflect this important reality, often addressing these two variables through distinct mechanisms for evaluation *post facto* in the decision-making process.

I have played a key role in administering and implementing a new initiative at the United Nations Secretariat for the Convention on Biological Diversity. It has involved a concerted effort to mainstream biodiversity in the health sector, and to mainstream human health in the environment sector. This is a logical extension of the CBDs ultimate purpose of conserving biodiversity, stressing its intrinsic value for human society. The CBD has pursued this project through several venues, including regional capacity-building workshops; the organization of international meetings such as the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) and Conference of the Parties (COP) and parallel events; the joint publication, with the WHO, CBD, UNFCCC and UNCCD of Our Planet, Our Health, Our Future: Biological Diversity, Climate Change and Desertification; and the development of a broad range of awareness raising and e-learning tools, most notably in the context of implementing the Strategic Plan for Biodiversity 2011-2020 and its 20 Aichi Biodiversity Targets. In spite of the progress achieved since 2011 when these activities were initially formalized at the Secretariat, much work remains to be done to achieve the effective integration of the health-biodiversity nexus on national, regional and global levels. The paper ends with a prognostic and prescriptive discussion of how Strategic Environmental Assessments can be utilized to better reflect the importance of the biodiversity-health nexus.

Cumulative Effects Assessment and the Increased Involvement of a Central Regulating Authority: A Realization of Potential (January 2013)

Author: Michael Farrell

Employer: Ontario Ministry of the Environment

Abstract

Cumulative Effects Assessment (CEA) in Canada represents an area of environmental regulation with a lot of unrealized potential. The current paradigm of including CEA as a part of a proponent's environmental assessment report is restrictive and limits the understanding of a project's effects when considered in the context of past, present, and future projects in an area of concern. The undertaking of a CEA by an individual proponent generally results in a focus on smaller scale impacts and project approval. Moving the responsibility of a CEA from a proponent to a central regulating authority (i.e. the provincial government) will improve the quality of CEAs and ease the regulatory process. The utilization of already existing monitoring and reporting frameworks by the central regulating authority allows for a much more representative understanding of specific project influences on cumulative environmental effects. Increased access to information, facilitated lines of communication and the authority to implement and ensure compliance with a mitigation strategy are all benefits that could be gleaned through increased involvement of a central regulating authority in the CEA process. Changing the CEA process has the potential to greatly improve our understanding of environmental systems and the manner in which our projects interact with and affect those systems on a cumulative scale. An improved understanding of cumulative effects results in more effective mitigation plans that reduce our environmental impacts in a movement towards no net effect.

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Canadian Aquaculture Regulation in the Absence of EIA: A Review of International Approaches with a Focus on the Experience of the United States and New Zealand (December 2012)

Author: Tina Marie Marchand

Employer: Environment Canada

Abstract

Aquaculture is the fastest growing food industry in the world and it makes a very important contribution to the Canadian economy. However, it has been a very challenging sector to regulate and it will be increasingly difficult in light of the recent changes to federal EIA requirements under *CEAA 2012*. Aquaculture regulation in the absence of EIA threatens to decrease regulatory efficiency and sustainability within the sector. However, a review of aquaculture regulatory tools that can be used and in fact they have been more appropriate for the sector. These include permitting processes, zoning, codes of conduct and best management practices. In order to overcome the emerging regulatory gap, Canada will have to focus on implementing a more streamlined approach to permitting, enhancing federal aquaculture law, developing national codes of conduct that are aligned with international standards and integrating the use of zoning at the provincial level. The changes made to Canadian Environmental Assessment will be challenging for the aquaculture sector, but it has put the Canadian government in a unique position to re-evaluate the way they regulate aquaculture and enhance their approach.

The Role of Strategic Environmental Assessment (SEA) in a Green Growth Strategy for Developing Countries (December 2012)

Author: Dominique Croteau

Employer: Stockholm Environment Institute (SEI)

Abstract

Based on the internship work on resource nexus and green economy, the current report analyses the role of Strategic Environmental Assessment (SEA) in a green growth strategy for developing countries. Green growth is found to be an intermediate stage between business-as-usual and the overarching concept of sustainable development. This view is contrasting from others who argue that green growth is simply the sustainable development concept repackaged differently under a new name. Although green growth is in fact related to sustainable development, it does not assess economic growth and environmental protection separately but instead strive to combine both by decoupling growth from environmental degradation.

Strategic Environmental Assessment (SEA) is seen to be a process where its practice tends to diverge from the theory, leading to the realisation that SEA is in continuous evolution and not confined to definitions constructed from previous Environmental Impact Assessment (EIA) experiences. It is found that SEA is a mainstreaming tool for the green growth concept in order for the latter to gain legitimacy in developing countries. It is also found that SEA should be the actual focus for the inclusiveness aspect associated with a green growth / green economy strategy. Through the use of valuation tools for ecosystem services and biodiversity (TEEB, REDD+, etc.), SEA can effectively monitor the impacts of a green growth strategy and ensure that its primary objectives are achieved.

It must be emphasized that both SEA and a green growth strategy are not sufficient to successfully reach sustainable development and additional elements will be needed such as political will.

Does Outdoor Air Affect the Particulate Matter Concentration in the Montreal Subway? (December 2012)

Author: Allison Lapierre Employer: Health Canada

Abstract

This internship report was developed as a result of a work term completed for Health's Canada's Air Health Science division that took place during the winter of 2011. The internship involved the data collection portion of a study conducted to assess the known pollutants of the subway environment in major Canadian cities. While conducting the data collection a temperature variation between subway station platforms was noticed. In response to this observation a question was developed: does the temperature of the subway platform correspond to the level of air flow between the outdoors and the subway environment? It was also hypothesized that the higher the air flow between the two environments the lower the concentration of particulate matter would be on the subway platforms. The average particulate matter concentration was found to be higher indoors 34µg/m3 than outdoors 27µg/m3. Twelve of nineteen stations' linear regressions, for each subway station, between the differences in particulate matter concentration and difference in temperature of the indoor and outdoor environments, had a positive relationship. Overall the relationship between the two variables had a statistically significant positive relationship in the summer and a negative relationship in the winter, though the latter was not statistically significant. Through the use of variance partitioning it was determined that relative humidity is more important than temperature difference in affecting particulate matter concentration of the subway environment. Further analysis is necessary to determine whether a relationship does exist between the air flow through the two environments and the particulate matter concentration.

Blowing in the Wind: An Investigation of EIA's Role in the Growing Wind Power Industry (September 2012)

Author: Jonathan Moorman Employer: RES-Canada

Abstract

The recent growth of the wind energy industry has been accompanied by its share of controversy over social, economic and environmental implications; public resistance, cost issues, and environmental effects have all played a part in impeding to a certain degree wind's penetration into the global energy market. While environmental impact assessment (EIA) has traditionally been used as a reactive tool, recent theory suggests that it could move into a pro-active role in the wind industry, promoting growth rather than simply minimizing adverse effects. Given appropriate methods, EIA practitioners could overcome each obstacle to wind energy by using a specific function contained in the EIA process. This paper uses a literature review to identify the obstacles, the EIA-based solutions, and the conditions under which these solutions could most effectively operate. A case study contextualizes the theory and an analysis then attempts to answer the question: can EIA be used as a tool to promote growth in the wind industry? The analysis suggests that the public participation component of EIA, given appropriate application, can be highly effective; that SEA, while potentially useful, is underdeveloped; and that although the impact prediction and mitigation function of EIA may promote industry by gaining official project approval, is not well enough defined to comprehensively preclude all environmental damage.

Implementing Effectively an Ecosystem Approach to Environmental Assessment Practices, from a Policy Perspective (August 2012)

Author: Liliana Andrea Sanabria

Employer: Environment Canada

Abstract

This report is the product of an Internship at Environment Canada's Environmental Assessment Policy Group, which purpose was to identify, though an internal research initiative, priority areas of the Environmental Assessment process where an ecosystem approach could be implemented. In this report, the results from the research are analyzed, taking as a framework the 12 principles of an Ecosystem approach formulated by the Convention on Biological Diversity, which include considering natural ecosystems' limits, complexity and interconnections, at proper spatial and temporal scales. The implications of Bill C-38, Growth and Long-term Prosperity Act, on the possible implementation of the approach are also analyzed, due to the significant changes that the enforcement of the Act will introduce to current Environmental Assessment legislation.

The method used in the research had two components, a Likert Scale or rating scale survey, that was applied to 16 Environment Canada's EA practitioners to measure their perception of current Environmental Assessment practices, and a subsequent consultation round with 5 regional managers, consisting of a selection of 5 out of 40 potential actions to implement an ecosystem approach. The results showed that the main areas of concern for practitioners are the need for managing ecosystems in an economic context, in a way that proper spatial and temporal limits of ecosystems are set, and that current EA practices are adapted to those limits, accordingly, adequate guidance on how to apply this in practice needs to be defined. Despite the intention of Environment Canada to go on with the implementation phase, Bill C-38 will pose additional challenges to it with major changes in EA-related legislation, giving priority to economic development, and ultimately reducing the possibility of giving a step forward to more ecosystem-based EA practices.

Involuntary Resettlement for a Proposed Railway in Karachi, Pakistan: Encouraging International Financiers' Safeguards in the Context of Environmental and Social Impact Assessment (May 2012)

Author: Ken Okumura

Employer: Japan International Cooperation Agency (JICA)

Abstract

Transport projects like railway construction sometimes require involuntary resettlement of people whose homes and businesses are located in the right-of-way and adjacent zones. The Environmental and Social Impact Assessment (ESIA) study of Karachi Circular Railway (KCR) revival project in Pakistan revealed that more 4,800 households would have to be relocated. 23,000 people who live in the illegally-built houses would have to be resettled even before construction begins. Using a review of involuntary resettlement practices in other places, the ESIA study is critically analyzed and recommendations are made. This paper concludes that while resettlement is treated as an externality in the ESIA study, it should also be seen as an integral part of the development process. Applying international financiers' safeguards in some countries is problematic due to structural and political constraints. This is particularly true in countries, like Pakistan, Bangladesh and India, where vestiges of the colonial legal system present obstacles for project sponsors and project lenders alike. Given these realities and the weak regulatory structure in Pakistan, international aid agencies can play a role in encouraging the Government of Pakistan and local implementing agencies to act more responsibly through the rigorous application of international safeguards. Such international safeguards in financing can have a great influence on how development projects are planned, designed, constructed, and operated. This can eventually lead to less severe negative environmental and social impacts and overall enhancement of the positive impacts.

The Role of Public Participation in Managing the Beauport River Basin: Education and GIS (April 2012)

Author: Yosef D. Robinson

Employeur: Groupe d'éducation et d'écosurveillance de l'eau (G3E)

Abstract

Public participation is an important mechanism of bottom-up watershed management, allowing the public to contribute to the decision-making process. The literature claims that bottom-up management is more efficient, transparent, and decentralized than top-down watershed management. It has been required by Quebec government watershed policy since 2002. The Quebec watershed policy, in fact, advocates mostly the bottom-up approach, but there is some room for the top-down approach. The paper briefly reviews why and how the bottom-up model of watershed management works better than the top-down model And examines two potentially effective ways of furthering community-based watershed management - environmental education (including student-scientist partnerships) and participatory GIS (including Geoweb tools like Google Earth) - are examined in the context of an internship carried out with the "Conseil de bassin de la rivière Beauport" (CBRB), a non-profit organization in Beauport, Quebec. Specifically, this report examines how scientists and educators from the Groupe d'éducation et d'écosurveillance de l'eau (G3E), a sister organization of CBRB, have educated groups of local schoolchildren on the importance of protecting their watershed. G3E's student-scientist partnerships (SSPs) are strong, but could be made even better with more resources, and could be connected to large, international SSPs like GREEN. The report also explores the potential of GIS and the Geoweb as tools for involving the public more effectively in managing the Beauport River Basin.

Using Risk Assessment in Managing Intentional Alien Species Introductions – A Case from Australia (March 2012)

Author: Anita Ogaa

Employer: Secretariat for the Convention on Biological Diversity

Abstract

International trade of live animals for the pet trade, food and agriculture can facilitate the spread of potentially invasive organisms which can cause serious environmental, social and economic harm. Managing the effects of invasive alien species (IAS) is challenging and requires strategy at the national level. The Convention on Biological Diversity (CBD) guidelines for a national strategy on invasive species recommend a transparent, science-based risk assessment as one of the most important tools in the management of intentional alien species introductions. Risk assessment evaluates the risks associated with contact with alien species and informs risk management decisions regarding the introduction of potentially invasive organisms and the allocation of resources in their control. This paper discusses five main characteristics associated with effective risk assessment today; namely, that it is science-based, requires reliable data,

manages for uncertainty, prompts legislation and educates the public. The Australian *Risk Assessment Model for Exotic Vertebrates*, which uses a quantitative approach to predicting the risk that species will pose if introduced into Australia, is examined as a case study to gauge how well it satisfies the current standards of risk assessment. The model is used by the Bureau of Rural Sciences and other agencies dealing with importation of live animals to Australia. The main conclusion is that while there is room for growth and development with the model in all five areas, it serves as an adequate and useful resource in assessing the import and keeping of alien species, and satisfies the CBD criteria for a useful risk assessment protocol.

The Recent Emphasis on Adaptation in the Management of Climate Change and its Impacts on EIA in Canada (February 2012)

Author: Bastien Fournier-Peyresblanques

Employer: Climate Risk Management Limited, trading as Acclimatise

Abstract

Since the Intergovernmental Panel on Climate Change (IPCC) published its first report in 1992, the field of environmental management (EM) has evolved. Although mitigation is still the main priority against climate change, the ability to adapt ourselves in a changing climate is growing to be prominent. In order to enable environmental practitioners to develop this adaptive capacity, the EM tools they used should be reviewed to avoid becoming obsolete. As both a planning and decision-making tool, EIA should allow its users to answer climate change considerations and help them develop the adaptive capacity of their projects. Canada has been recognized by a study on EIA commissioned by the OECD as a leader in integrating climate change considerations into their EIA procedure. This paper examines whether or not this statement is true and if the same can be said for the implementation of adaptive management. By examining the measures taken by the Canadian Environmental Assessment Agency (CEAA) and the Canadian Environmental Assessment Act (CEA Act) I was able to establish where Canada stands on these matters. Then, through the case study of EIA in the UK, I was able to place the advancement of Canada in a larger context. Finally, the case studies of Canadian companies and the research I did during my internship allowed me to demonstrate what should be Canada's next steps and more importantly why they are essential for Canada's future.

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Les Enjeux que Représentent les Examens Préalables Sous la Loi Canadienne sur l'Évaluation Environnementale : Analyse des Performances de Transports Canada sur l'Évaluation des Effets Cumulatifs et la Surveillance Environnementale (December 2011)

Author: Jean-François Marsan

Employer: Transports Canada

Sommaire

Les examens préalables jouent un rôle essentiel sous la *Loi canadienne sur l'évaluation environnementale*. En effet, les examens préalables correspondent à plus de 99 % de tous les types d'évaluations environnementales amorcées sur une base annuelle au Canada. Il est donc primordial que ces examens préalables soient menés d'une manière adéquate. L'objectif de ce rapport est d'évaluer les performances des rapports d'examen préalable produits par Transports Canada en ce qui concerne l'évaluation des effets cumulatifs et la surveillance environnementale. Un audit a été effectué sur 50 rapports d'examen préalable, basé sur des critères légaux et des critères de qualité. Les critères légaux ont été déterminés par les dispositions de la *Loi canadienne sur l'évaluation environnementale* tandis que les critères de qualité ont été déterminés en fonction de la littérature scientifique. Les résultats de cet audit démontrent que la pratique des examens préalables de Transports Canada sur ces deux aspects d'un examen préalable est inadéquate. Afin de pouvoir améliorer les performances de Transports Canada, de nombreux changements devront être apportés. Non seulement des améliorations devront être apportées sur les pratiques de Transports Canada, mais également sur la *Loi canadienne sur l'évaluation environnementale*.

Investigating the Relevance of the ISO 14001 Standard in the Development of Canderel Management's Environmental Sustainability Program (September 2011)

Author: Patrick Culhane

Employer: Canderel Management

Abstract

The past 15 years have seen a growing number of companies make a concerted effort to evaluate and to pro-actively mitigate the negative environmental and social impacts of their core activities through Corporate Social Responsibility (CSR) programs (Auld et al., 2008). In developing these programs, many organizations leverage outside frameworks to define and establish their initiatives. For those firms seeking to develop their environmental programs in particular, ISO 14001 is one prominent framework. In this paper, the applicability of the ISO 14001 program in developing Canderel Management's (a Montreal based commercial real estate company) sustainability program is considered. The spirit of the ISO 14001 standard was adhered to in the development of Canderel's sustainability program; however, those elements which were deemed unnecessary for the company's needs were left aside (Boiral & Sala, 1998). Other areas which were not wide enough in focus, such as the Initial Environmental Review (IER) were expanded upon. By undertaking a modified version of an IER Canderel was better able to identify the market, legislative and internal forces driving the need for a sustainability program, thereby providing the company with a clearer sense of the environmental aspects the program should focus on. Given the prominence of industry specific building certification programs such as LEED and BOMA BESt, and the resources and costs associated with attaining ISO 14001 certification at Canderel could not be justified.

The Environmental Petitions Process: Enhancing Environmental Governance through Transparency, Public Participation and Accountability (June 2011)

Author: Liohn Sherer

Employer: Office of the Auditor General, Commissioner of the Environment and Sustainable Development

Abstract

Measuring the effectiveness of sustainable development policies and programs is a challenge for governments worldwide. The aim of this paper is to contribute to the measurement of Canadian efforts to achieve sustainable development by evaluating the Environmental Petitions Process (EPP). The EPP allows Canadian citizens to submit questions and requests regarding the environment and sustainable development to the Federal Government. The evaluation is based on three pillars of effective environmental governance: transparency, public participation, and accountability. Definitions of the concepts are developed with reference to the environmental governance literature, and their complex interrelationships are explored. The EPP contributes to transparency by providing the public with a mechanism to access a wide variety of information about decision-making rationales, processes and impacts. The public can use the EPP to directly influence decisions and to feed information into Government decision-making systems. Finally, the EPP gives both Parliamentarians and citizens the information they need to hold the Government accountable, and gives citizens a mechanism for doing so by requiring Ministers to respond to the public's questions. Despite the effective design and strong potential, the EPP' effectiveness is dependent on the participation of the public. Few petitions are received (the number peaked at 47 in 2008) and participation is declining (only 19 were received in 2010). As such, the value of the EPP' outputs is questionable at best. Further research is recommended to measure the extent of its contribution to sustainable development in Canada.

Citizen Science: Assessing its Contribution to Environmental Monitoring (May 2011)

Author: Ashley Lauren Caya

Employer: The North American Commission for Environmental Cooperation

Abstract

Effective public stakeholder engagement in planning and monitoring is an essential component of successful environmental management (EM) and environmental impact assessments (EIA). Facilitating effective public engagement involves informing citizens of the potential impacts of development, and providing them with opportunities to participate, share knowledge and have input into decisions that affect them. This paper addresses the contributions of citizens to environmental monitoring in the context of EM and EIA. Informed by experience gained through an internship with the North American Commission for Environmental Cooperation (CEC) in Montréal, Québec, this report discusses the opportunities and constraints for citizen monitoring and volunteered knowledge, referred to as 'citizen science', to support decision-making, for habitat and species conservation. More specifically, this report provides a detailed overview of a growing body of literature and empirical evidence supporting the contribution of citizen scientists as monitors for a volunteered source of scientific information. A case study of the North American Monarch Conservation Plan (NAMCP) is provided to explore a specific experience with citizen science. Managed by the CEC, the NAMCP supports and coordinates citizen monitoring through local data observation and data collection to better inform decisions on species conservation on the continental scale.

A comparative Evaluation of Control Operation and Management of Gypsy Moth (Lymantria dispar)(L.), Gorse (Ulex europaeus) and Scotch Broom (Cytisus scoparius) in Canada and New Zealand (May 2011)

Author: Ashvin Ramasamy

Employer: Secretariat for the Convention on Biological Diversity

Abstract

Invasive alien species (IAS) are species that migrate from one environment to a non-native one, where interaction with the receiving environment leads to significant economic losses while harming biodiversity (Pimentel et al. 2005). IAS have the capacity to cause irreparable damage to ecological communities by changing the species composition or the abundance of indigenous species. The present study focuses on gypsy moth (Lymantria dispar (L.), scotch broom (Cytisus scoparius) and common gorse (Ulex europaeus); all three are pernicious pests in both British Columbia (BC) and New Zealand, two areas with similar climates, but where the strategies pursued vary in breadth and depth. The Case Study aims to support the nascent Canadian experience by examining the more successful approaches adopted by the latter country. In New Zealand, management practices owe much of their success to the Biosecurity Act, 1993, a unique legal tool which requires administrative regions to analyse the costs of intervention as well as the costs of adverse economic effects by pests of varying risk levels, in addition to structuring prevention, eradication and control plans for deleterious species. Control has been more effective in New Zealand than in BC, as the latter has operated under a fragmented management system. Recent developments in BC, however, suggest an increased interest in holistic approaches to control that rely more on adaptive management principles. The New Zealand approach represents a robust model that can be integrated in the merging Canadian initiatives such as the Canadian Invasive Plant Framework and that could support plans and programs that follows the Invasive Alien Species Strategy for Canada (2004-2010). Further, intergovernmental organizations stand to gain from assessing the effectiveness of their IAS management guidelines against the New Zealand approach.

More Than Just A Load of Rubbish: An Analysis of a Waste Assessment Conducted for the YMCAs of Québec (April 2011)

Author: Aaron Baxter

Employer: YMCAs of Québec

Abstract

Over the summer of 2010, I was hired as an intern by the YMCAs of Québec to carry out a waste assessment of all of their 11 centres located on the island of Montréal. The internship mandate was also the first concrete step taken by the organization to scrutinize its own environmental performance – a first step towards an improved environmental management system (EMS). Using a mixed methodological approach, including both qualitative and quantitative data-gathering tools, the aim of the assessment was to collect information about both the amount and character of the waste being generated, as well as the organizational reasons for which this waste was being produced. Through the process of conducting the assessment, however, a number of unintended effects were produced that also contributed significantly to an improved environmental performance. By drawing from social theory on power/knowledge and framing/overflows as well as on the theoretical literature on EMSs, this paper analyzes the particular methodology used for this waste assessment and shows how it benefited the YMCA and ultimately contributed to an improved EMS of comparable quality to ISO 14001. Insodoing, this analysis contributes to the literature on EMS through addressing the impacts and unintended effects of the process of implementing an EMS which had hitherto not been specifically discussed.

Engaging Stakeholders for Public Participation (April 2011)

Author: Chelsea Quirke

Employer: Commission for Environmental Cooperation

Abstract:

The purpose of this report is to explore how stakeholders are enlisted to participate in public consultation forums held by project officials, and how this process ultimately defines who counts as the public in public participation. This is important because public participation is used as a mechanism for reaching consensus on many of the final decisions that govern our daily lives. Two methods are explored to help understand which stakeholders are enlisted to participate in public consultations. The first is a method of selecting and inviting stakeholders, the second is a method of engaging stakeholders through social media. A case study from the Commission for Environmental Cooperation (CEC) then demonstrates how these two methods are put into practice and as a result leads to a public community composed of expert stakeholders. This report concludes that each public community is unique and composed of specific stakeholders depending on the methods of engagement used by officials and the time and resources available. Therefore it is revealed when using public participation as a mechanism for final decision making we are actually gathering the opinion of the stakeholders who were enlisted to participate by those in charge rather than a representative opinion of the greater society

EIA and Project Finance in India: Challenges in Implementing International Environmental Standards (April 2011)

Author: Andrew Sanford

Employer: Export Development Canada

Abstract

This paper, written after a four month, full-time internship at Export Development Canada (EDC), examines the Environmental Impact Assessment (EIA) process in India and identifies challenges associated with the implementation of international environmental standards for project finance transactions that take place in the Indian context. The first part of the paper contains a brief explanation of EDC and the roles and responsibilities that were associated with the internship. The body of the report begins with an examination of the literature relating to emerging international trends in project finance and EIA in India, discussing the recent trend toward responsible lending and identifying environmental challenges that currently exist in India. An investigation of India's environmental laws, policies, enforcement, and EIA procedures then provides an understanding of the regulatory structure that is currently in place. Finally, the report contains a detailed analysis of the International Finance Corporation's Performance Standards on Social and Environmental Sustainability that contains country-specific issues related to social and environmental assessment and management systems, labor and working conditions, pollution abatement, community health and safety, land acquisition and involuntary resettlement, biodiversity conservation and sustainable natural resource management, indigenous peoples, and cultural heritage in the Indian context.

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Global Change Research and Development at the USDA Forest Service: Woody Biomass Energy, Science, Policy and Controversy (January 2010)

Author: Melanie McCavour

Employer: USDA Forest Service

ABSTRACT

It is widely expected that the ongoing emission of greenhouse gases will increase temperature and decrease water availability, and have net negative impacts on plants, animals, and human society. Facilitated adaptation may be necessary for plant species that cannot move or adapt rapidly to these changes; this adaptation may be through artificial dispersal, genetic conservation, and breeding and engineering programs. One way to mitigate anthropogenic carbon dioxide release to the atmosphere is by sequestering carbon in tree plantations on previously unforested land (afforestation). A variant of this would be genetically engineered (GE) trees capable of rapid growth on non-arable land; these trees can be used as woody feedstock for bioenergy. Projects such as this can help mitigate global change and satisfy international GHG reduction goals and commitments, while at the same time providing renewable energy and a sustainable source of jobs for rural communities. A major impediment to the use of GE trees as biofuel is oppostion to GE in general. A case study examined here involves the application by a private company to field test a GE Eucalyptus hybrid capable of rapid growth. The Environmental Assessment (EA) indicated that little impact was expected because of stringent safeguards (e.g. reducing the capacity of the GE variety to produce pollen), and thus the project has been approved by the USDA Animal Plant and Health Inspection Service. It is argued here that much of the public opposition to using GE plants for biofuel, especially in Europe, is due to an unwillingness of regulatory agencies to be transparent and lack of public trust in science.

Aboriginal Consultation in the Northwest Territories (January 2010)

Author: Lesley Johnson

Employer: Environmental Assessment and Monitoring Unit of the Government of the Northwest Territories

Abstract

The following report reflects on the author's engagement in the topic of Aboriginal consultation during her internship at the Environmental Assessment and Monitoring Unit of the Government of the Northwest Territories. During this time, the author drafted an Aboriginal consultation training course for the government.

Aboriginal consultation has resulted from the Crown's legal obligation to protect Aboriginal and treaty rights as defined under s. 35 of the *Canadian Constitution Act, 1982*, and also serves as a tool to right the historic inequalities dealt to the Aboriginal peoples of Canada. Consultation often arises from the environmental assessment (EA) process, as adverse impacts can potentially cause infringement to Aboriginal rights. EA in Canada has been criticized for marginalizing Aboriginal people from participating in the process. In the Northwest Territories (NWT) a new EA regime, the Mackenzie Valley Resource Management Act (MVRMA), has emerged. The MVRMA mandates considerable Aboriginal participation.

Aboriginal and treaty rights have a long history of jurisprudence in Canada, beginning with the Royal Proclamation of 1763, and were recently further defined by a series of court cases in the 1990s. Comprehensive land claim settlement and self-governance have recently been determined as an inherent right in many cases. The NWT has five settlement regions, which in part created the MVRMA to replace the *Canadian Environmental Assessment Act* (CEAA) in the territory. The MVRMA fosters Aboriginal participation in the EA process; however, it is ultimately the Crown's responsibility to ensure proper consultation has occurred. Case law stemming from EA has informed the principles, and the content or extent of the Crown's duty to consult and accommodate. The Ka'a'Gee Tu First Nation v. Canada court case is a case study that demonstrates the commitment to upholding the consultation process and principles in the NWT, throughout the EA process.

The free-market mineral leasing regime in the NWT is in conflict with the concept of Aboriginal title. Differences between the goal of the Department of Indian and Northern Affairs Canada's (INAC) free-market regime land licensing system and the various co-management boards goal to protect the environment and Aboriginal values of the territory often come into conflict. The NWT is recommended to review the licensing process to consider Aboriginal title. A second recommendation is to implement community-based consultation protocols, furthering Aboriginal decision-making and self-determination in the process.

Follow-up is often a weak area in EA frameworks. Effective follow-up protocols and promoting Aboriginal participation can be mutually reinforcing concepts. A final recommendation is to create mandatory follow-up programs that include Aboriginal consultation and participation for certain types of activities, such as for mineral or petroleum projects that have undergone EA.

Is Canadian SEA Successful? A Three Tiered Investigation into SEA Success within Canada (March 2010)

Author: Katheryne O'Connor

Employer: Environment Canada

Abstract

The upcoming review of the Canadian Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals has attracted much attention to current strategic environmental assessment (SEA) practice within Canada. Presented here is an evaluation of SEA success framed within three distinct methods. The first method reviews current academic literature to obtain and identify the objectives of SEA and to investigate how SEA contributes to sustainable development (SD) and decision making (DM). The second tier of evidence is based on two previous evaluations conducted by Canadian Government, which also serve as case studies. The final measure of success is an independent analysis of six SEA obtained from the Canadian International Development Agency (CIDA) that are evaluated against three sets of criteria related to SEA procedural performance. These Criteria were obtained from the International Agency of Impact Assessment, the Privy Council Office, and the CIDA. The literary analysis found that SEAs are currently heavily reliant on outdated assumptions of rational DM, and complex SD theories. These issues must be addressed if SEA is become procedurally successful and effectively integrate into DM, therefore contributing to sustainable policy plan and program initiatives. The grey literature focused more on process to support SEA within the federal government and found that there is a lack of compliance within departments due to insufficient enforcement of the Directive, lack of capacity, rushed reports and insufficient political will. The final procedural evaluation resulted in poor overall performance of SEAs at meeting the selected criteria and a clear lack of focus on fundamental SEA issues such as SD, DM and alternatives. Overall SEAs within Canada are not successful in their current form, and do not meet academic, national or departmental standards. Once these shortcomings are addressed then SEA can evolve into a more intergraded DM tool contributing to the pursuit of SD.

Barriers to a Multi-Barrier Approach to Drinking Water Management in Small Community Systems (April 2010)

Author: Sylvia McIntosh

Employer: Health Canada

Threats to water quality and quantity can have a profound impact on health, the environment and the economy. As such, society should not be complacent about drinking water safety and needs to invest the required technical, financial and managerial resources. Historically, the quality of drinking water was determined almost entirely through compliance monitoring however, in recent years, there has been a shift from a reactive approach to a proactive approach. The multi-barrier approach is a modern concept of drinking water management that is widely accepted and applied in developed countries. The approach breaks down the drinking water system into three main components: the water source, the treatment system and the distribution system, and implements preventative actions at each step to reduce the likelihood of contamination. It also stresses that numerous procedures and tools related to system operations and management need to be in place such as: legislative and/or policy frameworks; guidelines and standards; science and technology solutions, and consumer awareness and involvement. In Canada, the majority of drinking water systems are small community systems including remote and rural supplies in both First Nations and Non-First Nations communities. Due to financial, social, and operational challenges, communities with small systems often have difficulty implementing the multi-barrier approach and ensuring safe drinking water. Small systems are required to meet the same health-based water quality standards as larger systems, however they lack the same resources and economy of scale. Although no approach will guarantee a 100 percent protection, the goal is to reduce the risk of contamination through prevention and control measures, and to increase the effectiveness of remedial action when incidents do occur.

The Role of Thresholds within the Adaptive Management Component of EIA Followup and Monitoring (April 2010)

Author: Elham Ghamoushi-Ramandi

Employer: Parks Canada

Abstract

The follow-up and monitoring stage of Environmental Impact Assessment (EIA) is crucial for the integration of project outcomes into the on-going EIA process. This report presents a comprehensive review of recent literature as well as a detailed examination of a particular case study from Saskatchewan. The theory section of the literature review examines key objectives of EIA follow-up and the importance of both implementing mitigation and determining its effectiveness. In particular, this report focuses on the role of thresholds within the adaptive management component of EIA follow-up. It is concluded that the adaptive management approach, through both theoretical and practical suggestions, is the best way to improve the environmental assessment process because it allows flexibility when identifying and implementing new mitigation measures or when modifying existing ones during the life of a project. The case study examined in this report provides an example where three specific mitigation effectiveness indicators from the Grasslands Grazing Experiment Follow-up Program were used to analyze the role of thresholds. The indicators in the analysis included: Road and Trail Monitoring, Spatial Distribution of Cattle, and Riparian Health Assessments. The monitoring of these key indicators provided a warning of unanticipated adverse impacts or sudden changes in impact trends, thus allowing decision makers to act before irreversible impacts occur.

Integrating Strategic Environmental Assessment into the Planning Process: Identifying the Factors in Effective SEA Implementation and Addressing the Constraints in Current Canadian Practice (April 2010)

Author: Kevin Oliver Lopez

Employer: Agriculture and Agri-Food Canada

Abstract

In contrast to environmental impact assessment (EIA), which is popularly recognized as the assessment of individual projects on a case-by-case basis, strategic environmental assessment (SEA) is the systematic and comprehensive process of evaluating the environmental effects of a policy, plan or program (PPP) and its alternatives. Canada has been recognized as one of the most prolific contributors to the field of SEA and it has committed itself through a set of sustainable development strategies to pursue environmental sustainability, using tools such as SEA. However, for the most part, the application of SEA within the PPP development process has been criticised as simply EIA being applied to PPP, not taking advantage of the benefits that a strategic assessment process can offer. This paper is written from the perspective that the SEA can be more effective in promoting environmental sustainability if it is utilized as a decision-making tool and not simply an impact assessment tool. The author argues that in order for practice to shift towards this ambitious approach, it must be well integrated within the PPP development process. The factors described for effective implementation are identified through a literature review of recent research into SEA. Furthermore, the structural, political, and cultural constraints that hinder this implementation are illustrated through a case study from the department of Agriculture and Agri-food Canada.

Wind Energy Development and Wildlife protection: Navigating between necessities (April 2010)

Author: Frédéric Gagnon

Employer: Helimax Energy

ABSTRACT

This report is an outcome of an internship at Helimax Energy, a wind energy consultant based in Montreal. The internship was conducted in the *Environment and Permitting* department, and consisted in contributing to the environmental impact assessment of wind energy projects in Ontario and Quebec. Research has shown that the main environmental impacts of wind farm are bird and bat fatalities. As the demand for wind energy grows, so does the risk of potential impacts to birds and bats, including species protected by provincial and federal wildlife laws. Understanding the laws and regulations protecting sensitive species and how they apply to wind farms was a subject of research during the internship and is the objective of this paper.

A literature search was conducted to identify information on bird and bat fatalities related to wind farms, and species protection legislation for Canada, Quebec, Alberta, the U.S, California and West Virginia, as well as examples of the application of these wildlife laws.

Three examples were examined. The heavily studied Altamont Pass Wind Farm case and the recent Beech Ridge Wind Farm case show that bad siting is perhaps the main contributor to both bird and bat fatalities, that the threat of a lawsuit under the *Endangered Species Act* is enough to entice owners to cooperate in finding mitigation solutions, and that public involvement is important to wildlife protection in the United States. The Syncrude case shows that the *Migratory Bird Convention Act* is not a sufficient motivator to persuade the oil industry to adopt environmental-friendly measures, and that the Canadian government, not the public, is the main instigator of the case. This case will test the resolve of the *Act* in protecting endangered species.

The lack of cases in Quebec where wind farms were brought to court under a wildlife protection law may be due to three factors: 1) a lower presence of endangered species in areas where wind farms have been placed is possible but doubtful, 2) a project review with a thorough environmental evaluation process and effective post-construction monitoring, 3) the issuance of incidental take permits which create a loophole in the intent of protected species laws in the name of sustainable development.

Suggestions to help wind farm owners deal with impacts to protected species include: better planning of wind farm location and turbine siting through thorough environmental assessments, application of present knowledge regarding bird and bat fatalities, continued research for practical and effective solution, improved cooperation between governments, owners, and the public.

Investigating the Consideration of Cumulative Environmental Effects and Climate Change in the Environmental Assessments of Canadian Mining & Processing Industry Projects from 1997-2010 (May 2010)

Author: Erica Brown

Employer: Environment Canada

Abstract

The assessment of cumulative environmental effects and climate change considerations under the Canadian Environmental Assessment Act, and their contribution to sustainable development, are of considerable interest at present. The assessment of cumulative environmental effects is regulated under the Canadian Environmental Assessment Act; however, the extent to which they are to be assessed is not. Climate change considerations, on the other hand, are not legislated for. Here, environmental assessment reports from four Canadian mining and processing industry projects between 1997 and present day (Cheviot Coal; Voisey's Bay; Galore Creek Copper-Gold-Silver; and Kerr-Sulphurets-Mitchell) are examined for their assessment of cumulative environmental effects, climate change considerations, and contribution to sustainable development. From the literature and lessons drawn from these case studies ten recommendations with regard to cumulative environmental effects and climate change are proposed for the 2010 Canadian Environmental Assessment Act review.

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Determining Impact Significance of Wind Farm: A Comparative Approach (May 2010)

Author: Meaghan Ferguson

Employer: Natural Resources Canada

Abstract

Abstract

Climate change and the burden of current energy sources are at the forefront of current environmental concerns. Cost-effective, carbon-free technologies are needed to encourage the production of renewable energy. Wind energy has shown tremendous potential, as it is both abundant and economically viable. However, research has shown that despite its clean image, wind energy does have a negative impact on the environment. Environmental impact assessment (EIA) is a regulatory tool used to mitigate the environmental effects of project development. Impact significance is a key component in EIA as it involves making judgments about the importance and acceptability of impacts. A review of the academic literature on wind energy identified the following valued ecosystem components (VECs) as having the most negative impacts on the environment: noise, visual effects and birds and bats.

Six environmental impacts statements (three from Canada, three from the United States) were compared using the VECs (noise, visual effects, birds and bats) discussed in the literature review. A comparison was drawn between the two countries in order to determine if 'best practices' in evaluating impacts through the environmental assessment of wind farms could be established. The analysis determined that for evaluating the visual effects of wind farms the US had stronger evaluation criteria, however Canada had stricter guidelines for noise. Lastly, the assessment tools used in evaluating impacts of birds and bats were similar in both countries. Recommendations on improving environmental assessment of wind energy in Canada are also discussed.

The Quality of Scientific Methodologies in Environmental Assessment: Strengths and Weaknesses of the EA for the Reconstruction of the Turcot Interchange in Montreal, Quebec, Canada (August 2010)

Author: Robert J. Moriarity

Employer: Landscape Ecology and Environmental Impact Assessment Laboratory

Abstract

The adequate detection of current and predicted environmental impacts from road projects cannot be achieved without valid and rigorous scientific methodologies. These impacts are important to detect so decision-makers can come to optimal decisions in order to protect surrounding human populations. This study has found that the quality of testing and scientific methodologies in the Turcot reconstruction environmental assessment report (Turcot EA) is weak when compared to similar road project EA reports. Methods and rationale used for noise level measurement and air and water sampling are diffuse, unclear and in some cases entirely absent. Baseline monitoring and monitoring design are weak for the environmental components examined, as are the scales of space and time in environmental models. Continued investigation revealed the evaluation of alternative project options is absent from the Turcot EA entirely and is therefore critically weak. Overall, the proposed Turcot reconstruction is based off a poorly written EA report with little scientific validity. In light of the findings from the literature and other EA reports, eight recommendations are proposed for a revised or new version of the Turcot EA.

Integration of Wildlife Issues in Federal Environmental Assessments: A Case Study of Environment Canada's Responsibilities (September 2010)

Author: Stephanie Titman

Employer: Environment Canada

Abstract

Canada's unique expanses of wilderness and countless wildlife species are highly valued as symbols of Canadian culture, important elements of healthy ecosystems as well as economically. Legislated species-at-risk protection is a relatively new concept in Canada under the Species-At-Risk Act, 2002 (SARA). Federal wildlife protection is also mandated under the Canadian Environmental Protection Act, the Migratory Birds Convention Act, the Canada Wildlife Act and the Fisheries Act. Under the Canadian Environmental Assessment Act, approval from Environment Canada, mandated as either a responsible authority or a federal authority, is required for a proposed development project to be accepted in the environmental assessment (EA) process. There have been concerns about perceived delays caused by wildlife protection issues in EAs. This research examines how federal wildlife concerns, including species-at-risk, are dealt with in the EA process considering twenty projects that have undergone panel review and comprehensive study assessments since 2003. The SARA requirements for EA are meant to help proponents identify the risk their projects pose to federally protected species-atrisk. Results indicate that wildlife concerns do not hold up the assessment process, but that the process is not effectively protecting wildlife due to narrow project scoping, inability to ensure mitigation, information deficiencies and process/capacity constraints. Recommendations, both at a broad scale and specific to Environment Canada, are given to improve the federal EA process.

Review of the Multi-Criteria Analysis Used for the Selection of a Dedicated Bus Corridor for the Montreal Bonaventure Expressway Project (September 2010)

Author: Catherine Doucet

Employer: Direction de Santé Public

Abstract

Comparison of alternatives is an important element in the environmental impact assessment (EIA) process. Multi-criteria analysis (MCA) is a practical tool in aiding the evaluation of alternatives. The project plan of transforming the Bonaventure Expressway in Montreal into an urban boulevard, derived from the internship experience at the Direction de Santé Public, provided an opportunity to investigate the MCA used to select a dedicated bus corridor. The objective of this report is to perform a comprehensive review and critique of the MCA approach used by the proponent, Société du Havre de Montréal, to select the dedicated bus corridor. I will highlight strengths, misuses, weaknesses and limitations of MCA. The main question that this internship paper will attempt to answer is: Does this multi-criteria analysis have sufficient and appropriate human and sociological environmental impact considerations? This paper contends that it does not. I constructed a modified more transparent MCA using the same data as the proponent to demonstrate that adding environmental components air quality and noise separately, two of the three corridors have small differences corridors in both score and weighted score. These closely aligned results are therefore potentially more prone to manipulation, as is demonstrated in this paper by applying small changes in scoring to affect and change the corridor choice. In its final report, the SHM should recommend a corridor that suits its needs while also satisfying environmental health considerations.

The Making of Toxicity: The Case of the Canadian National Management of Textile Mill Effluents (September 2010)

Author: Nicole Becker

Employer: Environment Canada

Abstract

In 2001 textile mill effluents (TMEs) were subject to an in-depth risk assessment as part of the Canadian government's Chemicals Management Plan (CMP) where they were determined to be 'toxic' and added to the Canadian Environmental Protection Act (CEPA) List of Toxic Substances. As a result, the Canadian government outlined risk management objectives for the substance and decided on a risk management tool to control the toxic substance and the risk it presents. Through this program, determination and management of risks and toxicity are presented as objective, real, and uncontested. However, I contend that risk is a contested subject and that determination and management of risks and toxicity are in fact highly contradictory and contingent processes which reflect a particular construction of the world. I show this by first analyzing the CMP and demonstrating how it operates through a discourse of 'modern risk' and employs strategies of the 'modern risk' paradigm, and secondly, by narrating my embodied experience as an intern at Environment Canada (EC), I illustrate the contingent and contradictory nature of determination of risks and toxicity. by showing how they are given form and substance and become meaningful objects. I argue that risk and toxicity are created, they are given form and substance and become meaningful objects, rather than risk and toxicity being pre-existing, real things, as the modern risk paradigm asserts.

Follow-up Programs under the Canadian Environmental Assessment Act: A Snapshot Analysis of Wind Farms in Canada from 2003 to 2009 (November 2009)

Author: Angela Goodfellow

Employer: Canadian Environmental Assessment Agency

Abstract

Follow-up programs under the Canadian Environmental Assessment Act (CEA Act) is mandatory for all comprehensive studies and review panels, but is discretionary for screenings. Wind power farms are typically assessed through screenings, but many have follow-up programs required due to their permitting process. As part of the Quality Assurance program at the Canadian Environmental Assessment Agency, the present study investigated the quality of several wind farm follow-up programs from 2003 to 2009. Two programs from 2003 demonstrated methods and results that were scientifically weak but that took advantage of the tools available at that time. Improvements were made to programs in 2006-2007, where much of the same methodology was used and made reference to earlier programs and research in the field of impacts on birds and bats. The most recent plan for the Wolfe Island wind farm was the most comprehensive program studied. It followed the protocols developed by Environment Canada for monitoring impacts of wind turbines on birds and it went further to develop an adaptive management plan for dealing with any unanticipated effects. Due to the proliferation of wind farms in recent years, monitoring of impacts has evolved substantially and has reached a point where plans are being developed that are in line with theoretical principles for effective follow-up. It serves as a good example of how follow-up should be performed under the CEA Act.

Inter-Governmental and Multi-Jurisdictional Environmental Impact Assessment: Options for Harmonization in Canada (December 2009)

Author: Jaron Dyble

Employer: Canadian Environmental Assessment Agency

Abstract

Given the existence of environmental impact assessment (EIA) legislation at the federal, provincial, and territorial levels, major development projects are increasingly subject to more than one regulatory and EIA process. The application of multiple environmental assessment (EA) requirements creates procedural and regulatory complexity and uncertainty. Consequentially, there is a growing demand from proponents, the public, as well as regulators to further cooperate, coordinate, and harmonize regulatory requirements. The following is an examination of how the complexities surrounding inter-governmental and multi-jurisdiction EIA are handled within a collaborative federalism framework. Four different approaches to multi-jurisdictional EIA are explored, including coordination, substitution, delegation, and consolidation, and recent case studies are analysed with respect to the costs and benefits associated with multi-jurisdictional coordination. Furthermore new opportunities for harmonization are presented. My findings suggest that while coordination presents the most feasible and successful model for intergovernmental and multi-jurisdictional EIA, a consolidated model in which the Canadian Environmental Assessment Agency acts as a central administrative and decision-making entity for federally administered EAs offers appealing advantages over the current self-assessment model. The conclusion is that opportunities for consolidation should be explored and considered by federal policy-makers while concurrently pursuing improvements to current harmonization agreements and legislation.

Streamlining the Environmental Assessment and Permitting Processes for Mining Project Proposals (December 2009)

Author: Meaghan Hoyle

Employer: Canadian Environmental Assessment Agency

Abstract

The federal regulatory review process in Canada comprises of two process: an environmental assessment and subsequent permitting. The two processes are inherently related in mining project proposals because environmental assessments (EAs) are often triggered by licences, authorizations, amendments, or permits that are issued during the permitting process. The scoping stage of the federal EA process under the Canadian Environmental Assessment Act is fundamental to the entire process because it determines how an EA will unfold, and the information that will be required by a proponent. Further, scoping identifies which statutory or regulatory approvals a proponent will need during permitting. A specific mining proposal, the Prosperity Gold-Copper Mine Project, is used as a case study to demonstrate the scoping procedures in a mining EA, and the lack of consistent standards regarding information requirements between the EA and permitting processes. This lack of consistent standards, along with other issues such as late triggering and timeliness, are being addressed through streamlining initiatives by the Canadian government. These recent government initiatives, including the creation of the Major Projects Management Office, are attempting to remedy apparent inefficiencies within the process. Weaknesses are still apparent however, prompting a discussion of changing the entire federal regulatory review process framework to that of a centralized model.

Key words: scoping, mines, federal regulatory review process, environmental assessment, *Canadian Environmental Assessment Act*, Major Projects Management Office.