

Cumulative Effects Assessment for Small Projects

Abstract

Applying today's cumulative effects assessment methods to small projects is like delivering snowballs with cruise missiles.

Large projects, e.g. mines or major infrastructure, are subject to relatively rigorous cumulative effects assessment, while small projects, e.g. mineral exploration, rarely are. Using the Yukon Territory in Canada as example, this paper compares the total environmental effects of the relatively few large projects in the past decades with the effects of development driven by small or very small projects or activities. For the purpose of this paper small projects are defined as projects subject to only the lowest level of impact assessment and large projects as projects subject to higher levels of assessment, including panel reviews.

The paper then examines the challenges associated with applying cumulative effects assessment tools to small projects. Chief among them the difficulty of burdening small projects with expensive and time-consuming cumulative effects assessment and the difficulty of managing or mitigating cumulative effects through conditions placed on individual small projects. The single biggest obstacle to applying currently available cumulative effects assessment methods to small projects may be the absence of a willing party to pay for it.

Finally the paper presents and discusses a few avenues for potential solutions to these challenges, including grouping similar projects, regional strategic assessment, and moving from conducting a separate cumulative effects assessment for each project to considering cumulative effects as context in assessing project specific effects

Introduction

Overview

Cumulative effects assessment is part and parcel of environmental impact assessment processes in many parts of the world. It often is legally mandated as part of the assessment process for individual projects. Much ink has been spilled on how to conduct cumulative effects assessment and the author has personally sat through countless meetings and workshops that stressed the importance of doing good cumulative effects assessment and lamented the limitations of project specific assessment to do so. Numerous articles and even books describe how cumulative effects assessment ought to be done.

Much of what has been written and talked about cumulative effects assessment is focussed on larger projects and considerable advice exists on how to conduct cumulative effects assessments on things like major infrastructure projects, mines, oil and gas pipelines and the

like (e.g. Canter 1999, Ross 1998). Less advice is available on how to appropriately address cumulative effects in the assessment or screening of small projects, such as early stage mineral exploration projects, minor infrastructure upgrades, small scale agriculture or forestry, or residential developments.

Using the Yukon Territory in northern Canada as example, the paper will first show that the cumulative effects of the many small projects can be more significant than those of the relatively few large projects carried out in a region. It will then discuss some of the challenges to applying cumulative effects assessment to small projects (as if applying it to large projects wasn't challenging enough). Finally, the paper will introduce some potential solutions that cumulatively could make a difference.

Definitions

For the purposes of this paper the following definitions apply. Any terms not defined are used in the broadest sense.

Designated Office Evaluation: In Yukon a Designated Office Evaluation is the basic level of impact assessment that numerous activities are subject to, including small project like mineral exploration programs. In other jurisdictions this might be called a preliminary screening. While Designated Office Evaluations involve a range of projects, they rarely reach beyond exploration projects, small mine expansions, or upgrades of existing infrastructure.

Executive Committee Screening: An Executive Committee Screening is a mid tier impact assessment in Yukon, roughly equivalent to an Impact Assessment under the Impact Assessment Act of Canada. Only larger projects, such a mines, major infrastructure developments, etc. are subject to this level of impact assessment.

Large Project: A project that is subject to an Executive Committee Screening or a panel review under the Yukon Environmental and Socio-economic Assessment Act.

Small Project: A project that is subject to a Designated Office Evaluation under the Yukon Environmental and Socio-economic Assessment Act.

Approach

This paper draws on the author's 20 years of experience in impact assessment for projects of all sizes, from minor infrastructure upgrades to mineral exploration, to basin opening pipeline projects. This experience was augmented by a rudimentary literature review (the literature covering cumulative effects is extensive, that specific to small projects not so much). It is further augmented by the outcomes of numerous meetings, workshops and presentations on the subject the author attended. To illustrate some of the hard lessons learned over two decades, and confirmed by much of the literature, workshops, etc., the paper uses development in Canada's Yukon territory over the past 15 years as case study.

The numerous meetings, workshops, and presentations, as well as a few courses on cumulative effects assessment revealed that the tools for cumulative effects assessments are mostly geared towards large projects. All the case studies presented certainly involved larger projects

only. However, the authors daily work with small projects raised the suspicion that small projects may actually be responsible for more cumulative effects than the relatively few large projects. The Yukon case study, along with some of the literature bears that out.

Once the importance of doing good cumulative effects assessment for small projects was established, it was rather easy to identify the challenges. The literature provided ample examples of cumulative effects challenges and the author's own experience provided the additional dimension of trying to apply cumulative effects assessment to small projects. The paper only presents a sampling of the challenges encountered. The possible solutions presented were similarly identified through a combination of literature review, conversations with colleagues, and seeing what does and does not work on a daily basis.

Why is it important?

Cumulative effects have been a concern throughout all of the 20 years the author has worked in the impact assessment field. While it started out more as a something "we also should look at", in recent years cumulative effects have become a key concern for almost every project. In addition to stressing the importance of cumulative effects assessment, IA participants have increasingly lamented the impotence of cumulative effects assessment in project-based assessment.

Because it is the law.

In many jurisdictions cumulative effects assessment is the law. In Canada the federal Impact Assessment Act of Canada requires it for specified, (large) projects (Dibo et al.2018). Other jurisdictions require it for all projects subject to an assessment at any level, e.g. the Yukon Environmental and Socio-economic Assessment Act (YESAA) or the Mackenzie Valley Resource Management Act in the Northwest Territories, a neighbouring jurisdiction. Similarly, Canada's Fisheries Act mandates the consideration of cumulative effects for projects of all sizes (DFO 2020).

What we can learn from the literature

The literature describes two key concepts of how the effects of small projects are important, the "tyranny of small decisions" and "keystone projects". The tyranny of small decisions refers to the phenomenon of regional environmental degradation occurring by default through decisions about many small developments without anyone ever making a conscious decision to develop an area or region. (e.g. Council of Canadian Academies, 2019).

Ehrlich (2010) describes an especially insidious version of this concept, the "free entry system" for mineral exploration that still exists in parts of Canada. People can stake claims without much scrutiny. Once someone has registered a claim, they not only have a right but a legal obligation to explore. Impact assessment only comes into play at later, more intrusive stages and serious consideration of cumulative effects really only in the few cases that proceed to an actual mining proposal. At no point is there a decision to develop an area. By the time any project comes

under serious scrutiny, it is virtually impossible to reverse the decision (or rather non-decision) to develop the area.

Key Stone Project are the opposite of small decisions. An individual, often larger, project in an undeveloped area enables many smaller developments, which combined can cause more environmental degradation than the initial project. The cumulative effects of the many small project are rarely considered in the assessment of the one that facilitates them. (Johnson et al, 2019)

A third way in which small projects can cumulatively degrade environmental quality is described by Potapov et al. (2017). Size matters and large intact forest areas are more valuable to some species than the same amount of forest in smaller parcels. Small projects may not remove a large portion of any ecosystem, yet they may have a large effect by breaking large areas in less valuable smaller parts. This matters especially in areas, like Yukon, where relatively large undisturbed, or little disturbed, tracts of land still exist.

What the Yukon experience tells us

From its inception in 2005 to the end of 2020, YESAB has completed assessments of 7 large projects and 3060 small projects. It stands to reason that prior to YESAB and prior to any environmental assessment legislation the ratio of small to large projects was somewhat similar. The vast majority of development in Yukon happened through small projects. Figure 1 shows all projects assessed under YESAA with large projects (i.e. Executive Committee Screenings) highlighted. Large projects are truly few and far in between. Small projects on the other hand cover a large portion of the territory.

The many small projects have a significantly larger footprint, extend into many more areas, and overall have a larger impact than the few big ones we tend to focus our efforts on. Or as Ehrlich (2010) put it: "What matters is the scale of the issues, not the scale of the development". Or, perhaps, as Duinker and Greig (2006) put it: "If we really wanted to do cumulative effects assessment, we would put the valued component in the centre and not the project".

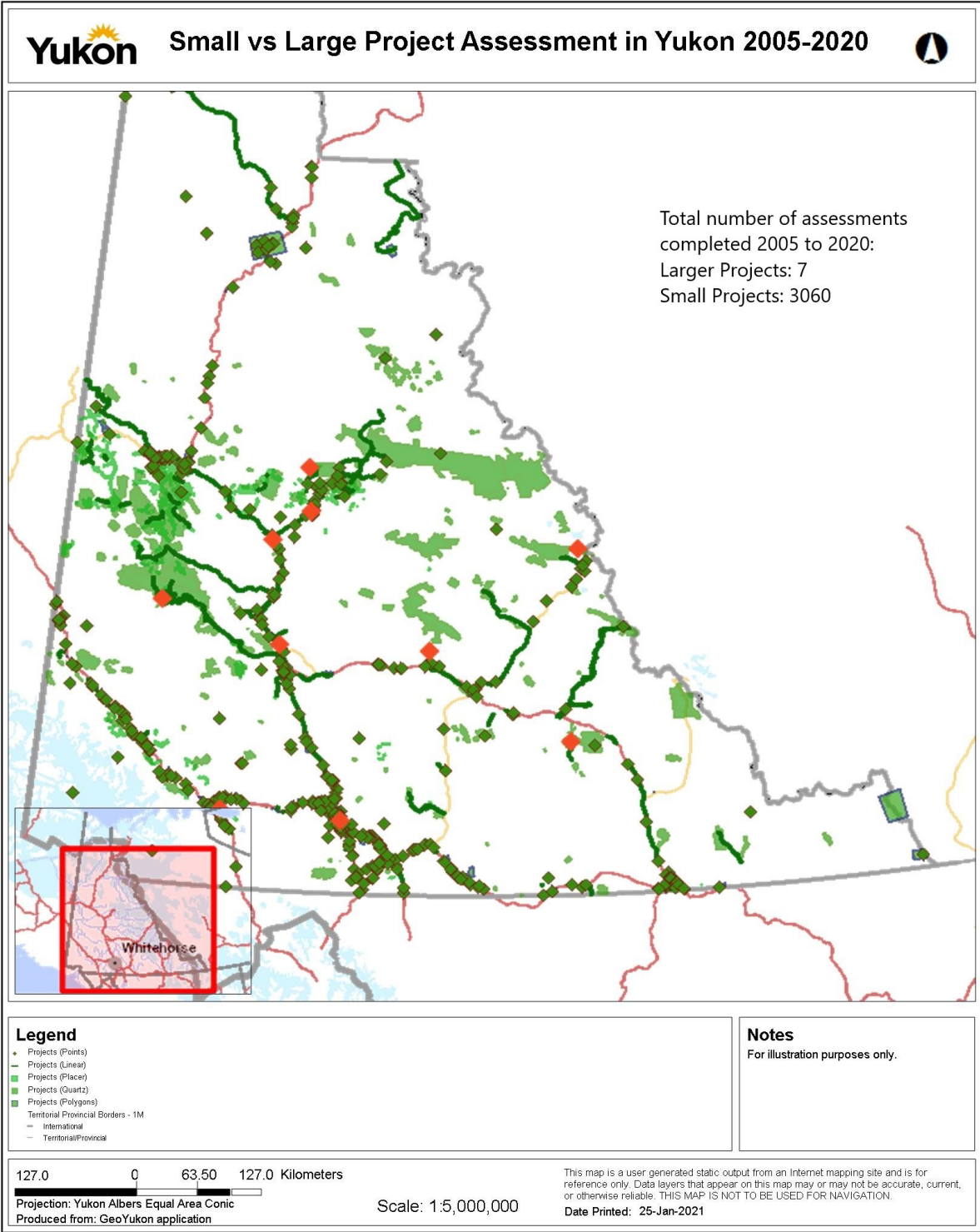


Figure 1: Project Assessments 2005-2020 (large projects shown include ongoing assessments)

What are the Challenges?

The paper presents a sampling of challenges regularly encountered. These challenges can be roughly grouped by “methodological challenges” and “fiscal challenges”. A possible third group includes attitudinal challenges. Naturally, these challenges are interrelated.

Methodological challenges

Cumulative effects assessment for small projects faces essentially the same methodological challenges as does cumulative effects assessment for large projects. However, the difficulties in applying cumulative effects assessment to small projects are often amplified. Some of the common challenges with cumulative effects assessment that are amplified in small projects are:

Baseline: Gathering baseline information is generally the responsibility of the proponent. Comparability and consistency between data sets for different projects is a big issue in cumulative effects assessment (e.g. Dibo et al. 2018). The problem becomes dramatically bigger when not a few projects but hundreds of them need to be analyzed, all with proponents who may not have the wherewithal to collect appropriate baseline data for many valued components. Baseline creep is a serious problem in cumulative effects assessment and especially with small projects, where the change with each project is imperceptible.

Temporal Scope: How far back and how far into the future to look is a tricky decision and has major implications for how many activities or projects are included in the cumulative effects assessment and against what sort of baseline the effects are being compared. For small, and especially for temporary projects there is rarely a logical timeframe. Is it reasonable to ask a proponent of a seasonal 5-year exploration program to include lingering effects from projects that occurred decades ago or may occur decades after their project has concluded?

Spatial Scope: Another difficult decision for any cumulative effects assessment is setting an appropriate spatial scope. If it is too small the effect of the project will dominate thus making cumulative effects appears diminished. If it is too large, the effects of the project will be diluted and its contribution to the cumulative effects appears diminished. For small projects it is easy to select a spatial scope that dilutes the already small effect to a point where it can be argued that is it negligible.

Monitoring: Monitoring is not only a tool for impact assessment follow up, it provides crucial input into cumulative effects assessment. However, systematic long term monitoring programs covering adequate areas are expensive to implement and maintain. Small, often short term, projects like mineral exploration projects or small-scale mining do not lend themselves for long term monitoring programs covering large areas.

Fiscal challenges

One of the key reasons that good cumulative effects assessments for small projects rarely occur is that simply nobody is prepared to pay for them. The number of potentially affected valued components is usually the same or only slightly less than for large projects. Hence the need for data collection and the need for specialized expertise from biologist, hydrologists, geochemists,

social impact assessment specialists, public health experts, etc. is comparable to that of a large project. While each expert may be able to spend less time on a small project, hiring the consultants needed to do a good cumulative effects assessment is nonetheless expensive. Small projects simply do not have the resources available. Nor do proponents of small projects always have knowledgeable staff inhouse. In addition, small projects are often assumed to make such a small contribution to cumulative effects that it is not worth looking into it.

While this paper focusses on cumulative effects assessment rather than cumulative effects management, some fundamental difficulties with dealing with cumulative effects of small projects became clear during the research. These difficulties have repercussions on the quality of cumulative effects assessments. Small projects have limited scope for mitigating cumulative effects. If a significant adverse effect results from 100 small projects, each individual small project can do little to mitigate the overall effect. In the author's experience cumulative effects assessment for small projects is often ignored, or satisfied with a few platitudes, because assessors see no reason to expend significant resources and effort when little to nothing can be done about it.

Another, perhaps more fundamental, attitudinal issue with cumulative effects assessment for small projects is the simple fact that few decision makers are prepared to make tough decisions, when seemingly there is not all that much at stake. No government official wants to be the one to explain to the proponent of a small project that theirs is the one that's pushing the cumulative effects over the significance edge and won't be approved, while dozens of similar projects have been approved in the same area already.

What Are Some Potential Solutions?

Cumulative effects are insidious and multi-pronged and there is no reason to think that the approaches to assessing (and managing) cumulative effects should not be multi-pronged and permeating all kinds of processes, disciplines, and jurisdictions as well. None of the possible solutions presented here will make much of a difference on their own. Simply put, cumulative effects require cumulative solutions.

The possible solutions or approaches identified in the course of the preparation of this paper can be loosely grouped into solutions available to impact assessment practitioners right now, solutions where the tools are available but do not fit into our processes, and pie in the sky, hopefully some day solutions.

Solutions we can apply right now

The following are approaches to cumulative effects assessment that are available to practitioners right now and are being practiced to some extent today.

Scoping the whole project: As has been pointed out by many (e.g. Ehrlich 2010) impact assessments should scope in all activities associated with a project, rather than just the triggering activity. For instance, in Yukon assessment of an agricultural land disposition may be triggered by only one activity: clearing of vegetation. However, the assessment ought to

include effects from all activities, including creating access, fencing, fuel storage, presence of farm animals, etc.

Grouping projects: Many jurisdictions have provisions to avoid project splitting and allow the grouping of multiple, closely related proposal into one project. Common tests for whether proposals are closely enough related included proximity and interdependence. Small projects that are very similar in nature and in close proximity, e.g. several mineral exploration programs in one area, are not usually interdependent, i.e. each one could go ahead without the others. However, if one is serious about addressing cumulative effects, one should consider grouping such projects into one larger project nonetheless.

Cumulative effects as context: A common approach to cumulative effects assessment is to determine whether an individual project is likely to have significant adverse effects, mitigate these effects, and then determine if there are residual effects. The residual effects are then considered alongside the residual effects of other projects in a separate cumulative effects assessment. Until 2018 YESAB used the same approach. Since then YESAB considers the cumulative effects of other past, present, or likely future activities as context for the significance determination for the project under assessment. In other words, any existing or likely future cumulative effects directly factor into the assessment of project effects rather than a separate cumulative effects assessment. In a similar vein Duinker and Greig (2006) advocate to stop treating cumulative effects as an afterthought that is dealt with after the project assessment is done. Cumulative effects ought to be considered throughout the entire assessment since “all effects are cumulative”.

Broadening reasonably foreseeable: Cumulative effects assessment includes effects from past projects, current projects, and projects that are likely to occur in the future. The latter are also often referred to as reasonably foreseeable. What is reasonably foreseeable has been subject to discussion for many years. Some jurisdictions have tried to put some boundaries around it, e.g. only projects for which regulatory applications have been submitted or that have been publicly announced. As Ehrlich (2010) points out, a narrow definition of reasonably foreseeable excludes many future activities that are quite likely to occur. Instead, a range of evidence should be weighted. It is not about being able to predict individual future projects but about being able to reasonable predict that there will be development of a certain nature.

Solutions that are available but do not fit into the process

The following are cumulative effects tools that are available but do not fit well into the processes for impact assessments of small projects. These tools are generally beyond the capabilities and resources of individual small project proponents and require government to shoulder the responsibility.

Regional assessment: Regional assessments take the burden of assessing the effects of all projects in a region off the shoulders of the proponent of an individual project. They can encompass all activities in a specified area or be focussed on a particular industry (e.g. NIRB 2019). Anecdotal evidence suggests that in Canada the occurrence of regional assessments in recent years has increased from almost never to rarely. In Yukon there is a lot of talk about

it, e.g. First Nations repeatedly suggest or request one in comments submissions for project specific assessments, but no organization has been willing to cover the costs.

Land use planning (in some areas): Land use planning can inform cumulative effects assessment, although often cumulative effects assessment is seen as input into land use planning. According to Ehrlich (2010) project specific cumulative effects assessment can drive regional planning. In much of northern Canada land use planning has not and is not occurring. There are, however, a handful of regional plans in place or under development. Land use planning can inform affects assessment not only through conformity checks against finished plans but the process itself can be useful in identifying valued components and just how valued they are.

Keystone project assessment: Not all keystone projects are large projects, sometimes a small project can induce further developments around it, e.g. by opening up access. Often keystone projects, however, are large projects undergoing higher levels of impact assessment, such as infrastructure projects including roads or pipelines. Johnson et al. (2019) lament that impact assessments rarely take the indirect effects of future development into account. They take issue with the often very narrow definition of reasonably foreseeable future projects. Indeed, there is no reason why the adverse effects of future development should be any less predictable than their economic benefits. If the benefits of future activities can be included in the justification of a keystone project, so can the adverse effects be included in the cumulative effects assessment for it.

Scenario analysis: Scenario analysis or simulation modelling has been around for decades and has proven itself a useful tool in regional assessments and in assessment of many large projects. With advances in computer technology it has and continues to rapidly improve. Among others, Duinker and Greig (2006) advocate the use of development scenarios for project specific cumulative effects assessment. Johnson et al. (2019) for instance extol the virtue of using scenario analysis for assessing indirect effects of keystone projects. Despite the tool's usefulness, there seems to be little sense to try to get a multitude of small project proponents all running their individual scenario analysis with their limited capacity and their limited data availability.

Monitoring: Generally speaking the more we know the better chance we have to get it right. A severe limitation of conducting cumulative effects assessment on small projects in the author's experience is the lack of data about the effects of past and current activities. While it may be reasonable to assume that ten similar projects in the same area have had some kind of adverse effect, there rarely ever is any monitoring data available to quantify or even describe the effect. And in the rare cases where monitoring data exists, there is no baseline data available to compare it to.

Things that currently seem pie in the sky

Cumulative effects assessments of the future may involve:

Artificial intelligence: Artificial intelligence allows to automate processes that currently are very time and labour intensive (and therefore expensive). While there are drawbacks, e.g.

a possible lack of transparency, where appropriate data exists artificial intelligence could some day allow techniques, like scenario analysis, to be applied to multitudes of proposals of all sizes without any individual proponent requiring specialized expertise and deep pockets. Alas, in many regions, and definitely in northern Canada, data is sparse. Applying artificial intelligence here, today would indeed be like delivering snowballs with cruise missiles.

Land Use Planning (in many places): Across northern Canada land use planning is one of the pillars of the natural resource management system. At least in legislation. In reality few land use plans have been completed and the process has not even started in most areas, despite legislation having been in place for decades. While land use planning can be a useful tool, its wide spread application, preferably in combination with regional assessments, seems to be a long way off.

Scrapping project specific cumulative effects assessment: Duinker and Greig (2006) postulate that project specific cumulative effects assessment should be scrapped in favour of regional assessments. They admit, however, that this is not likely to happen anytime soon anywhere and that in many places no processes are in place that would enable adequate regional assessments. Replacing project specific cumulative effects assessment with regional assessments requires the creation of significant new legislation.

Closing

In summary, we need to stop excusing small projects just because they are small. Tools for better, if perhaps not necessarily good, cumulative effects assessment are available to practitioners today. Other tools are available and could be deployed with relatively minor adjustments to the process, e.g. by government agencies shouldering a bit more of the responsibility.

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