

The length of environmental review in Canada under the *Fisheries Act*

Derrick Tupper de Kerckhove, Charles Kenneth Minns, and Brian John Shuter

Abstract: There is a common misconception among government officials that environmental regulations are bad for economic growth. Citing economic reasons, the Canadian federal government passed legislation in 2012 restricting the length of environmental reviews of new developments, even though review times were not empirically known. Using annual reports to Parliament from 2001 to 2010, we estimated using time-series analyses that review times under the *Fisheries Act* conformed to the new government mandated review times prior to major legislative changes to federal environmental oversight. The majority of submissions were processed within 1 year for mitigated impacts and within 2 years for authorized impacts. While it is possible that a minority of projects take longer, there is no evidence of large backlogs in the review process, and Canadian review times appear quicker than those in the United States. We highlight the need for empirical estimates of the costs of environmental regulations before governments enact substantial legislative changes that reduce environmental oversight and offer alternate recommendations for expediting environmental review times.

Résumé : Les représentants gouvernementaux considèrent souvent, à tort, que la réglementation relative à la protection environnementale nuit à la croissance économique. Évoquant des raisons économiques, le gouvernement fédéral du Canada adoptait, en 2012, une loi qui restreint la durée des examens environnementaux de nouveaux projets et ce, en l'absence de données empiriques sur la durée de ces examens. À la lumière de rapports annuels du Parlement de 2001 à 2010, nous avons estimé, à l'aide d'analyses de séries chronologiques, que les durées des évaluations environnementales menées en vertu de la *Loi sur les pêches* étaient conformes aux nouvelles durées prescrites par le gouvernement avant l'entrée en vigueur d'importants changements législatifs relatifs à la surveillance environnementale par le gouvernement fédéral. La majorité des demandes était traitée dans l'année en ce qui concerne les impacts devant être atténués, et en deçà de deux ans pour les impacts autorisés. S'il se peut qu'une minorité de projets prenne plus de temps, rien n'indique des retards importants dans le processus d'évaluation, et il semblerait que la durée des évaluations soit moins longue au Canada qu'aux États-Unis. Nous soulignons la nécessité d'estimations empiriques des coûts de la réglementation environnementale préalablement à la promulgation par les gouvernements de modifications législatives importantes qui limitent la surveillance environnementale et nous proposons d'autres moyens permettant de réduire la durée des évaluations environnementales. [Traduit par la Rédaction]

Introduction

Last year, the Canadian and United States federal governments passed executive orders, budget legislation, and policy changes with the goal of expediting environmental review times for industrial, commercial, and public infrastructure projects (Government of Canada 2012a; The White House 2012). In Canada, the government also reduced funding, closed regional offices, downsized staff, and weakened environmental laws within the federal environmental regulatory sector under the justification of modernizing a regulatory system that inhibits economic growth (Government of Canada 2012a; Favaro et al. 2012; The Canadian Press 2012). However, empirical studies on the length of environmental reviews are extremely rare in the United States and do not exist in Canada; thus, it is difficult to ascertain whether environmental review times are indeed longer than should be required to protect the interests of the public. Further, while the economic impact of environmental regulations is often perceived by many as negative (Konisky 2008), economic analyses generally yield mixed results (Jaffe et al. 1995), with some even suggesting that companies can incur a strategic benefit from regulatory delays by using environmental review as an opportunity to claim a stake in a project or develop a good reputation among investors (Wirth et al. 2011). The ecological and health benefits of environmental oversight have been well documented, as has the need for thorough studies of

potentially complex projects that may require multiple field studies over many years (Underwood 1997; Minns et al. 2011). However, new Canadian public policy will arbitrarily restrict the length of environmental reviews to between 1 and 2 years (Government of Canada 2012a). Given the important public and environmental implications of restricting environmental oversight, we used empirical estimates of review times under the Canadian *Fisheries Act* to assess the length of environmental review times in Canada. We chose the *Fisheries Act* as the focus for our study because it mandates a high load of environmental reviews, has been identified as a contributor to the potentially long federal review times (Government of Canada 2012b), and its legislative powers have recently been reduced (Favaro et al. 2012).

Submissions under the *Fisheries Act* are first screened for projects that do not in fact involve fish habitat, which are subsequently dismissed, thus not requiring regulatory review under the *Act*. Regulatory reviews of projects involving fish habitat can lead to one of three outcomes: (1) the project will be allowed to proceed as long as potential impacts are mitigated following directives provided in a letter of advice or operational statement (i.e., mitigated outcome), (2) the project will be allowed to proceed even though potential impacts are unavoidable because they will be offset by fish habitat compensation projects agreed upon by both the developers and the government (i.e., authorized out-

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Table 1. Selected data from Fisheries and Oceans Canada's Annual Reports to Parliament on the activities of the fish habitat management regulatory branch by fiscal year (1 April to 31 March).

Fiscal year	Submitted referrals	Mitigated outcome	Authorized outcome	Shoreline works (%)	Instream works (%)	Watercourse crossings (%)	Resource extraction (%)
2001–2002	12 427	6 922	438	22	19	18	5
2002–2003	13 089	7 502	532	25	19	18	7
2003–2004	13 234	8 548	671	24	19	20	8
2004–2005	9 763	6 363	655	15	28	29	6
2005–2006	8 624	5 531	580	19	27	29	5
2006–2007	7 245	5 031	435	17	26	27	7
2007–2008	7 333	4 662	280	18	26	26	7
2008–2009	7 453	4 436	287	18	26	28	5
2009–2010	7 455	4 819	296	18	27	27	5
2010–2011	7 722	4 271	369	17	26	30	5

come), or (3) the project will not be allowed to proceed because the impacts are unavoidable and too great to be offset (i.e., rejected outcome; for more detail of the review process see Goodchild 2004).

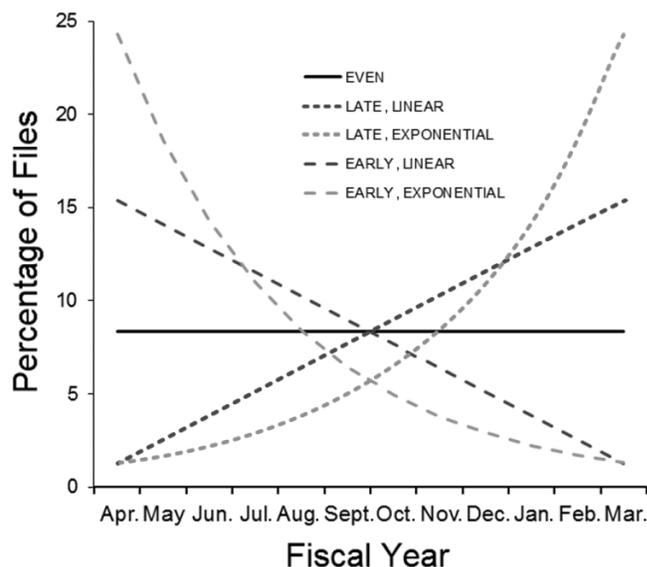
Methods

The numbers of submitted reviews (i.e., referrals), mitigated outcomes, and authorized outcomes were collected from Annual Reports to Parliament from the Fisheries and Oceans Canada website (<http://www.dfo-mpo.gc.ca/habitat/role/141/reports-rapports/index-eng.htm>) and reviewed for summary information regarding the Fish Habitat Management Program (Table 1). The annual reports only list the total number of referrals and outcomes that occurred in one particular fiscal year (1 April to 31 March) and do not list or estimate any processing time for the reviews, nor do they explicitly state how many referrals were dismissed before review or rejected following a review. However, as dismissed projects do not require any substantial review and rejected outcomes are extremely rare (Favaro et al. 2012), their combined impact on review times in Canada should be rather small and were ignored in this study.

The proportions of reviews submitted by industry or development category were extracted from the summary tables in the annual reports to demonstrate the range of economic activity that the *Fisheries Act* addresses. Further, the typical area of fish habitat affected by these economic activities was estimated using a geometric mean of Canadian fish habitat compensation data reported in Lange et al. (2001). A geometric mean was used to report the central tendency of the data rather than an arithmetic mean, which could be inflated by one very large outlier project (Crawley 2007).

The decade-long dataset was converted into a time series to estimate the effect of the number of referrals on the number of mitigated and authorized outcomes. Cross-correlation of referrals versus mitigated outcomes and referrals versus authorized outcomes were conducted using the “acf” and “ccf” autocorrelation functions in the R Statistical Language (Crawley 2007) using each fiscal year as a unit of time. Both these functions calculated the regression coefficients between the two variables while applying sequential time lags between the two variables. A significant correlation across the two time series would suggest a lack of significant backlogs in the system. Further, the significance of the time lags (e.g., 1 or 2 years) can suggest how long the processing time generally takes. This method is commonly used to estimate causal links between two variables that may experience time delays because of hidden internal processes in economic studies (Álvarez-Díaz et al. 2010). Because we only have access to annual data, we are not able to assess whether the distribution of referrals or outcomes were relatively even across the year. If there was a strong bias in any of the datasets, it may skew our results (for example, if most referrals were submitted in March, and most

Fig. 1. Hypothetical distributions of submissions or outcomes under the *Fisheries Act* to determine whether extreme bias within the year will influence the time-series analysis that assumes even distributions across the year. Note that linear and exponential distributions bias the frequency of data by 73% and 83%, respectively, towards either the early or late half of the fiscal year.



outcomes were achieved in April, we may incorrectly assign a full year to an actual review time of only a couple months). To account for potential biases, we assigned a few hypothetical extreme data distributions to our dataset (see Fig. 1), shifted the time-series window by 6 months (i.e., 1 October to 30 September), and reran our analysis to examine the robustness of our conclusions (see Fig. 2). Shifting the time series by 6 months allows the biased distributions to modify the actual total annual numbers while preserving the known relative changes in submission rates from year to year.

Results and discussion

The annual number of submitted project reviews ranged from 7245 (in 2006) to 13 234 (in 2003), with on average 60% mitigated and 5% authorized annually (Table 1). The analysis of this time series suggested that reviews leading to a mitigated outcome were likely processed within the year of submission (with few occurring past the next year), while authorized outcomes were likely processed within the year following the initial submission (few past the second year; Fig. 3). Years with smaller submission loads were not followed by years with proportionately higher numbers of completed reviews — this suggests that higher submission

Fig. 2. An example of testing for potential bias in the *Fisheries Act* dataset using 2003–2004 and 2004–2005. This example demonstrates a late bias for submissions (dotted lines) of referral with an early bias for the mitigation (dashed lines) outcomes using exponential distributions and represents that most extreme distribution used for potentially quick review times hidden within the annual datasets.

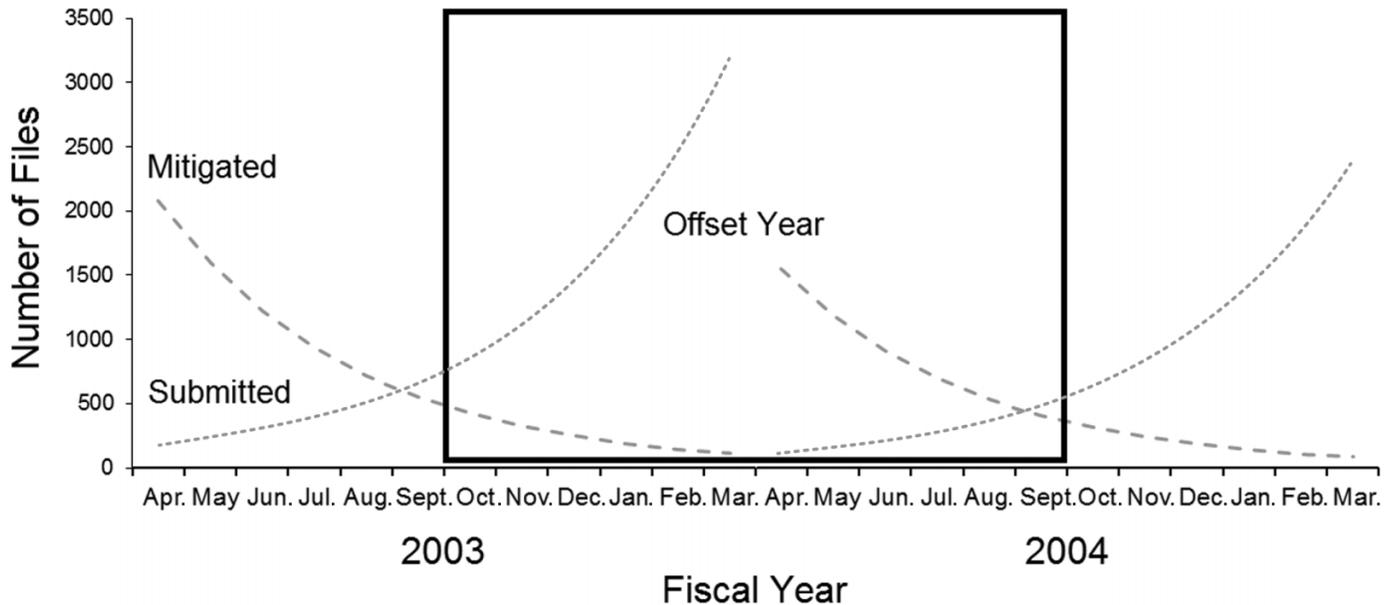


Fig. 3. Autocorrelation curves demonstrating the cross-correlation (r^2 , regression coefficient) between the annual number of submitted reviews and (A) mitigated and (B) authorized outcomes, respectively, under different year lags. The r^2 values that surpass the dotted line are significant at $p < 0.05$.

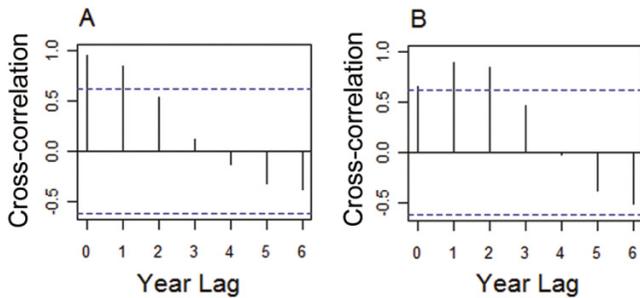
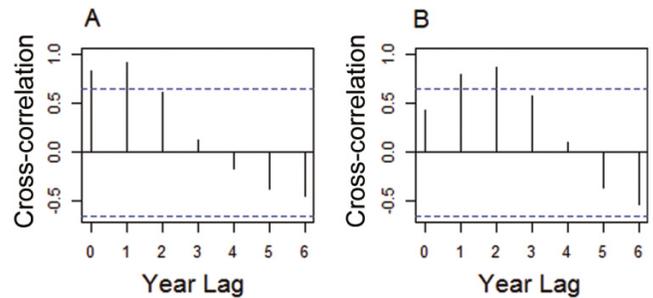


Fig. 4. Autocorrelation curves demonstrating the cross-correlation (r^2 , regression coefficient) between the annual number of submitted reviews and (A) mitigated and (B) authorized outcomes, respectively, under different year lags for an extreme biased distribution where ~85% of referrals are submitted early and ~85% of outcomes are realized late within the fiscal year. The r^2 values that surpass the dotted line are significant at $p < 0.05$.



loads did not generate significant backlogs in the review system. None of our hypothetical distributions qualitatively changed these results, suggesting that even potentially large biases in the distribution of data across the year would not lead to significantly shorter or longer review time estimates. In our most extreme distribution, where roughly 85% of referrals are submitted early and 85% of outcomes occur late in the fiscal year (i.e., the opposite of Fig. 2), we saw no change in the significance of time lags (see Fig. 4). Further, our results are supported by more detailed information from a smaller set of *Fisheries Act* reviews falling under the *Canadian Environmental Assessment Act* (from annual performance reports from 2001 to 2005 publicly available on the CEAA website: <http://www.ceaa-acee.gc.ca/default.asp?lang = En&n = C5C19E38-1>). These reports indicated that 95% of the reviews were completed within the same year of submission, and at any given time regulators under the *Fisheries Act* had an ongoing review load of between 400 and 600 projects. There are few points of comparisons available with other countries; however, review times under the *Fisheries Act* were considerably shorter than the 8 years typical for highway development reviews under the American *National Environmental Policy Act* (Todorovich and Schned 2012) and less than

the 3 years for Environmental Assessment Worksheet and Environmental Impact Statement review in the state of Minnesota under *Minnesota Rules 2009* and their *Environmental Policy Act* (State of Minnesota 2011).

These findings suggest that environmental review times generally conformed to the government's preferred timelines prior to the recent policy changes. However, first-hand evidence of longer review times was presented in the 2012 Canadian federal budget from a handful of energy and natural resource extraction industries (Government of Canada 2012a). This discrepancy could be due to the overall small proportion of projects submitted for review under these sectors. We found that the natural resource extraction sector represented only about 5% of annual project submissions under the *Fisheries Act*, with instream, shoreline, and water-crossing works being much more common (see Table 1). Our time-series analysis would not necessarily reveal whether there was a substantial minority of projects that took many additional years to complete. Thus, it is quite possible that the perceived problems with environmental review times in Canada are restricted to a narrow industrial sector or at least to a minority of

projects. This is the case in Minnesota where most reviews took 3 years, but mine applications could take up to 5 years or more to review (State of Minnesota 2011). However, if our results suggest that the review process under the *Fisheries Act* is generally efficient, then the longer review times for the natural resource extraction sector may be merited based on a much higher potential to cause environmental damage. Resource extraction often involves complex and potentially damaging elements (e.g., pipelines, mines, and hydroelectric dams) that affect much larger areas than smaller watercourse crossings, shoreline rehabilitation, or instream works. For example, our analysis of 122 case studies of authorizations given under the *Fisheries Act* between 1998 and 1999 found in Lange et al. (2001) revealed that forestry, mining, and hydroelectric dams affected roughly 10 times the area of fish habitat compared with channel realignments, water management, and dredging. Given these larger areas, multiple seasons of field sampling may be required to fully understand the environmental resources within the project footprint (Underwood 1994) and suggest effective mitigation strategies (Minns et al 2011). Thus, an extended timeline would be essential for regulators to develop and review appropriate environmental impact assessments.

Notwithstanding larger projects, the review of projects across the last decade has been within the government's preferred timelines and appears to reflect the operation of a reasonably efficient system where regulators have successfully processed files even during periods of higher submission loads. To arbitrarily impose fixed and relatively short (compared with other jurisdictions) timelines on the small minority of projects that may merit protracted review is to risk endangering robust environmental protection in Canada while providing no improvement in review times to the great majority of projects. We offer three recommendations for alternate actions that would expedite review times without weakening environmental oversight:

1. There is a need for more empirical studies on environmental review times and the sources of common delays to regulatory review in North America (Todorovich and Schned 2012; State of Minnesota 2011). In comparison, common delays impacting the construction phases of project development are well known, including changing markets, labour shortages, design changes, and inclement weather (Panagiotis et al. 2012). Increased knowledge of the sources of regulatory delay would allow for better contingency planning during periods of high economic growth to maintain high review capacity and anticipate backlogs. Further, regular internal audits of regulatory review times should be conducted to provide ongoing implementation of an adaptive management process whereby regulations can be retailored to accommodate the needs of the review process.
2. A set of standardized environmental assessment methods is needed at the federal level in Canada. There is a wide range of qualitative and quantitative methods available for assessing, monitoring, and predicting the impacts of development on fish habitat (Underwood 1994; Minns et al. 2011). However, with no standard set of methods prescribed to developers, regulators receive environmental assessments that contain methods and models outside of their scope of expertise. This situation then spawns a potentially lengthy tendering process to select outside experts that are competent to evaluate such assessments. If a standard set of methods for the baseline data collection, impact modeling, and construction monitoring were prescribed, the expertise within the federal regulator body could be tailored to these methods. In Canada, standard baseline and monitoring protocols have been developed in some provinces (Alberta, British Columbia, and Ontario) and for some federal regulations (e.g., Metal Mining and Pulp and Paper Effluent Environmental Effects Monitoring programs),

which have been adopted by industry. There are other benefits to a standardized methodology across the country, including an increased certainty in (i) auditing the effectiveness of the regulatory process in protecting natural resources by being able to compare the same type of fish habitat measurements before and after development, as well as across the country (Quigley and Harper 2006) and (ii) planning development timelines for industrial stakeholders.

3. Streamlining the administration of environmental regulation across different jurisdictions and removing duplicated review processes have both been identified as needs by the federal governments in both Canada and the United States. Analysis of the regulatory review process for American highways led to recommendations to (i) increase federal leadership on major projects, (ii) create pre-existing agreements for the delegation of duties among regulatory agencies, and (iii) build capacity within regulatory sectors to avoid administrative bottlenecks (Todorovich and Schned 2012). We agree with these recommendations and agree with the direction of current Canadian policy that duplication in review responsibilities among federal agencies (i.e., Fisheries and Oceans Canada; Environmental Canada) should be reduced.

Conclusion

Inordinately long review times (Government of Canada 2012b) may be a misperception based on a minority of cases, and thus the recent environmental policy changes in Canada may have little effect on the pace of economic growth. Governments should recognize that environmental oversight is a necessary and valuable component of the approval process for development projects and that alternate options exist for managing the submission load aside from weakening environmental protection. We echo the recommendation from the American policy statement on highway reviews (Todorovich and Schned 2012) that greater federal leadership is required when protecting the health of the public's wild resources and the environment. We also note that Canada's federal Commissioner of the Environment and Sustainable Development reported that resource development is currently outpacing improvements to environmental protection, and this, in tandem with the recent changes to environmental laws such as the *Fisheries Act*, is putting the public and wild resources at risk (Office of the Auditor General of Canada 2012). While our study provides the first estimate of review times with publically available data, we encourage the federal government to refine our estimate with the more detailed information of individual referrals at their disposal and use a strong evidence-based approach when designing federal environmental policy.

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