

**Study Board Responses to
Independent Review Group Review of
“Managing Water Levels and Flows in the Rainy River Basin”**

June 30, 2017

The International Joint Commission’s Directive for the International Rainy-Namakan Lake Rule Curves Study Board specified that documents produced during the study be reviewed by an Independent Review Group (IRG). As the Study Board developed its Final Draft report, sections were given to the IRG for review throughout February, March and April 2017. IRG comments on these sections were provided to the Study Board for its consideration as they were available, along with more specific technical and editorial observations. The Study Board subsequently provided revised sections to the IRG for a second review. After issuing the Final Draft Report for public comment, the Study Board prepared responses to IRG comments. Substantive comments of the IRG, and Study Board responses to those comments, are provided below.

IRG Comments provided February 16, 2017

This review covers Chapter 1 to 3 (minus Figure 1, Section 2.2, and Table 3). The reviewers agree that these chapters are well written and the text generally flows well. The write up on the Shared Vision Model (SVM) would benefit from additional explanation, either in this section or elsewhere in the report. The peer reviewers had a number of questions that focus on the clarity of how information is being integrated and used by the SVM. However, at this stage, it is not clear to the peer reviewers if this work is will be elaborated on more in the following chapters under sections identified as “Study Approach”.

Another area requiring attention relates to Tables 1 and 2 (and, by extension, Figure 6.) It is not clear by the titles whether entries are a specific performance indicator (PI) or a category of indicators (e.g., mussels). It is also not clear whether the tables are independent or linked, although it appears from the legend in Table 2 that linkages exist. If so, these tables need to be cross-referenced as the terminology changes (e.g., Archeological vs Cultural) and entries are not consistent between the two tables (e.g., flooding and ice damages are separate in table 1 and grouped in table 2, coverage for whitefish in each table is different.) It is not clear when there is an overlap in PIs for Weight of Evidence (WOE) vs SVM approaches whether they are actually the same PI or different and whether and how they will be compared. These apparent inconsistencies should be corrected or explained. The peer reviewers recommend that an annex accompany each table to provide additional details for each specific PI

Study Board Response:

The Final Report includes a substantially revised Methodology section (Section 3.4) to clarify the SVM and to provide clearer explanation of Performance Indicators (PIs), including organization and interpretation. In addition, Annex 5 presents a full description of each PI, organized by Study themes.

IRG Comments provided February 17, 2017

This review covers Section 2.2, provided for review February 16. Reviewers find that this section appropriately organizes and presents information on interests affected by water levels and flows. Three more substantive comments are offered:

1. The Board's Study Strategy discussed peaking and ponding; if included in the effort undertaken, it would be appropriate to frame the connection between peaking and ponding and water levels and flows in this section.

Study Board Response:

Peaking and ponding are briefly discussed in the Final Report (Section 2.2.2). The report also references a Fact Sheet prepared by the Study Board to explain how these dam operations can affect water levels and it will be posted on the Study Board website. Ponding is not practiced by either Dam Operator. While peaking affects the outflow profile from Rainy Lake throughout the day and night, the Dam Operators must still meet the same daily outflow targets necessary to maintain Rule Curve compliance. That is, within-day fluctuations are immaterial to the lake level and therefore are not a consideration in Rule Curve design or evaluation. As such, the Study Board views the development of operational guidelines to balance outflow changes from Rainy Lake with Rainy River interests as the most practical approach.

2. A general discussion of multi-year flow regimes may be helpful as it affects plants and fish.

Study Board Response:

The Study Board distinguishes "multi-year flow regimes" from "inter-annual variability". It assumes the former refers to multi-year periods of wetter-than-normal or drier-than-normal conditions. The latter refers to variability in water levels, particularly in the open water period, over a number of years. State of Nature modelling indicates that, with the exception of the occasional 2-year drought or the drought period of the 1920s, persistently high or low flow periods have not occurred in the basin. Rather, these lakes follow a regular pattern of spring refill followed by decline through the fall and winter in most years. In effect, the hydrology resets each spring. The resulting lake levels will vary during the open water season based on the relative inflow conditions, but this is not sustained for a multi-year period. Under rule curve regulation, this variability is greatly reduced, particularly on the low end. Only in years where inflow is very low or very high and the dams cannot effectively control the lake level do levels go outside the relatively narrow rule curve band. The Study Board explored Rule Curve Alternative E as an approach to increase this variability.

3. A careful edit is suggested for consistency of presentation among the various subsections; some sections include language that suggests water management recommendations. The reviewers feel that this section should focus on primarily factual statements.

Study Board Response:

The Final Report has been revised to ensure consistency in language throughout and to remove language that suggests recommendations.

IRG Comments provided March 6, 2017

This review covers Chapters 4 and 5, provided for review February 28 and with a revised Table 5-1 provided March 1 that had only a minor revision made to the legend for the symbols.

Reviewers find that Chapter 4 is well written and provides a reasonable overview of outreach undertaken, as well as issues raised by the public and by Tribes, First Nations, and Métis. It is clear that significant opportunities have been provided to get input from all interests. Reviewers have no substantive comments on this chapter.

The reviewers had numerous questions and significant comments after reading Chapter 5. This is a key chapter in the report and therefore may warrant special attention.

1. The overarching framework regarding the Weight of Evidence and Shared Vision Model (SVM) / Integrated Ecological Response Model (IERM) requires clarification. This clarification may affect Chapter 3 as well as Chapter 5. Specifically, clarification would be helpful as to whether the “Weight of Evidence” is intended to refer solely to expert judgment after reviewing specific studies, with additional information from SVM and/or IERM supporting it, or whether the “Weight of Evidence” now integrates SVM and/or IERM and is no longer a separate concept. Reviewers presume that the latter framework applies; however, some language in both Chapters 3 and 5 is consistent with the former framework.

Study Board Response:

The Final Report removes detailed discussion of methodology from Chapters 5 and 7 and presents a substantially revised Methodology section in Chapter 3 (Section 3.4). This revised section clarifies the use and interpretation of the SVP, WOE and IERM.

2. The reviewers suggest a greater level of scientific rigour in explaining the results in the various categories (*i.e.*, fish, wildlife...). While some categories provide the information reviewers sought, not all do, nor is the format consistent from one category to the next. Reviewers were looking for the following information, for each category and for each geographic region (Namakan Lake Rainy Lake, Rainy River):
 - a. Expected results
 - b. Study results, with sufficient explanation and references to provide a basis for those results
 - c. Reconciliation/explanation of differences
 - d. Summary statement of overall finding (particularly helpful when multiple measures for a single entry differ), leading to the compilation of summary statements in “Key Findings”.
3. While the effort to include all results for the 1970-2000 comparison of rule curves is appreciated, Table 5-1 was difficult to navigate. This is due in part to each entry having two meanings, one due to location in the chart and the other due to type of entry in the chart. Also, what is the distinction between “Neutral” and “Inconclusive”? It may be helpful to extract the portion of Table 5-1 pertinent to a section and place that after the reader has read through the content and findings. Reviewers also suggest placing the full table at the end of the chapter along with the summary of findings. Similarly, a summary table at the end of Section 5.3 could provide a better approach for evaluating SON. That section does not provide such an analysis, yet in Section 5.4 a statement is made regarding SON.

Study Board Response (to #2 and #3):

The Final Report has been substantially revised and reorganized and now reflects these comments.

4. Additional information regarding specific indicators for the Weight of Evidence Study Subjects would be useful, perhaps in a table as an annex. Are there specific indicators, what are they, and how do they support the findings described in Chapter 5? If there are multiple indicators for a particular finding, how was the conclusion derived? Were they weighted in some manner? The findings and overall assessment is based on this, and therefore this needs to be clear and any associated limitations need to be identified.

Study Board Response:

The Final Report has been substantially revised and reorganized and now reflects these comments. Annex 5 presents detailed information on the development of the PIs used in the analysis.

IRG Comments provided March 13, 2017

This review covers Chapter 6, provided for review March 8. The reviewers found that this chapter needs to be modified to help the reader clearly understand the assessment of alternatives.

1. Reviewers did not find that the different interests are reflected in the selection of alternative rule curves to explore and that the focus was only on addressing only two aspects: flooding and environmental interests. Presumably that is both because other interests did not voice pursuable concerns with the 2000 Rule Curves (although one sentence implies that, at minimum, there are some navigation concerns) and because the effect of the alternative rule curves on all other interests will be described in detail in Chapter 7. If this understanding is correct, reviewers suggest stating this up front. Reviewers also suggest referring readers to Chapter 7 for full details whenever an effect on other interests is described, since Chapter 6 does not fully address impacts to all other interests (again, presumably this will occur in Chapter 7.)

Study Board Response:

The Study Board sought opinions from the general public and its advisory groups on the merits and limitations of regulation of Rainy Lake and the Namakan Chain of Lakes under the 2000 Rule Curves. These comments covered broad areas of suggestions or concerns, many of which were focused on improving operations by the dam operators and the Water Levels Committee as well as communications with the public. Few, however, related specifically to altering the Rule Curves themselves. Areas where alterations to the Rule Curves were suggested -- flood reduction and ecological concerns -- were the focus of investigation by the Study Board.

IRG Comments provided March 24, 2017

This review covers Chapter 7-9, provided for review March 21. The reviewers had numerous questions and significant comments after reading Chapter 7, as noted below.

1. The Performance Indicators are not sufficiently explained. While Chapter 3 notes that they are individual metrics, often reported as ratios of the alternative score to the baseline, no information has yet been provided that defines each metric. Questions therefore remain regarding what each metric is, how it is determined, the degree of confidence in each metric, any limitations regarding its use, and how one metric relates to another. In addition, assuming ratios among Performance Indicators imply similar degrees of effect, the qualitative language used to describe them should be applied consistently.

Study Board Response:

The Final Report removes detailed discussion of methodology from Chapters 5 and 7 and presents a substantially revised Methodology section in Chapter 3 (Section 3.4). This revised section now includes a better explanation of the interpretation of results. As well, Annex 5 presents a detailed description of the PIs used in the analysis.

2. If the intention of descriptive text is to highlight notable observations only and allow model results to more fully document comparisons between an alternative and the 1970 and 2000 Rule Curves, an up-front statement to this effect would be helpful. Descriptions do not always compare each alternative's results to the 1970 and 2000 Rule Curves, and some descriptions offer comparisons instead to earlier alternatives, which can be confusing particularly since the supporting charts immediately following do not include that information.

Study Board Response:

Chapter 7 in the Final Report has been substantially revised and now presents a concise and consistent summary of the key findings under each alternative.

3. The volume of data provided is daunting and makes this chapter extremely large and challenging for the reader. Reviewers suggest removing the many tables and instead including three tables (for Rainy Lake, Namakan Lake, and Rainy River), possibly in an appendix, that show all 7 alternatives plus the 1970 and 2000 Rule Curves and the State of Nature results. This will allow readers to compare an alternative to the 1970 and 2000 Rule Curves and the State of Nature results and also to other alternatives considered; it will also eliminate the need to repeat information (as currently presented, only a single column changes from one set of tables to the next across all alternatives.) Tables presenting a simple "better, not significant, worse" or similar approach could also be considered in order to flag particular areas of interest (in addition to one with numbers, since it would be appropriate to report model results and this would be best in an appendix)

Study Board Response:

The Study Board agrees that Chapter 7 is a lengthy chapter. However, on balance, it concluded that it was important for the Final Report to demonstrate, in a comprehensive and transparent manner, how it arrived at its findings and recommendations. The Board believes that the chapter is well organized and flows in a clear, logical and consistent manner through the alternatives under consideration.

The Study Board did not hear from any advisory groups members or during the public comment period that these chapters are too lengthy, and so have decided to leave it as is. It did, however, provide more summary information in the Executive Summary and within Chapter 7.

Chapter 7 in the Final Report has also been considerably strengthened through the use of improved graphics (rather than many small tables) comparing each alternative rule curve with the 2000 Rule Curves and 1970 Rule Curves.

Reviewers had limited comments on Chapter 8 (*note: now Chapter 9*).

1. Chapter 8 includes quasi-recommendations, presented as core elements to address future water level extremes and uncertainties in the basin (Section 8.6, page 7). Ideally these recommendations should be complete as presented; they can be reiterated in Chapter 9 in more summary form if desired and as options for an organizational framework (Section 8.7). In addition, three options are presented for organizational framework; it should be made clear whether one option is recommended or why three approaches are provided without recommendation.

Study Board Response:

The Final Report has been revised and now reflects these comments. Chapter 9 (formerly Chapter 8) sets out the rationale and benefits of adopting an adaptive management program for water level management

in the Rainy River basin, outlines three broad models that could be considered, and proposes one such model for more detailed consideration. Chapter 10 now includes a more comprehensive recommendation with respect to adaptive management.

2. Reviewers were unclear why, after this study, system operations and study for dealing with water extremes were considered to be “not thoroughly addressed”, particularly given analyses including stochastic and climate change water supply sequences.

Study Board Response:

The Final Report has been substantially revised and no longer includes this preliminary observation. The Study Board believes that its analysis has, in fact, addressed the issue of water level extremes in the basin. With regard to the uncertainty of future water supplies, it concluded that no set of rule curves will be able to address the impacts of water supply extremes under climate uncertainty and change; this finding, in fact, reinforces the importance of adopting a comprehensive adaptive management program in the basin.

Reviewers agreed that the introductory section of Chapter 9 (*Note: now Chapter 10*) was well written and an excellent overview of the rationale for the study and lead-in to findings and recommendations. Comments are as follows.

1. This chapter ideally should not include new information not presented or explained previously in the report, but rather draw previous information together. Towards a more synthesized conclusion, reviewers recommend carrying each finding through to its disposition to make it clear what is being done (or not done) to address the issue; if that disposition is a recommendation, it can be repeated later in that section. Numbering recommendations and then listing all later would assist the reader in referring back if necessary. Finally, reviewers suggest grouping related subjects (e.g., those associated with rule curve changes, those more administratively oriented, those more factually oriented.).

Study Board Response:

With respect to new information introduced in Chapter 10 (formerly Chapter 9), the Study Board has added to Chapter 4 a discussion on observations that describe issues not otherwise brought up in subsequent chapters that are, nevertheless, included in recommendations in Chapter 10 (e.g. terms of reference for WLC).

The Final Report has been substantially revised. Each Study Board finding is numbered, and each finding (or group of findings under a particular subject area) is followed by a recommendation. As well, all the recommendations are listed again at the end of the chapter, on a single page, for ease of reference.

2. Reviewers suggest considering reviewing the list of recommendations for a sense of priority and practicality, and tempering or elaborating where appropriate in order to avoid potentially creating undue expectations. Providing a sense of scale or likely resource intensity may be helpful in some instances.

Study Board Response:

The Study Board appreciates that it has proposed a substantial number of recommendations (11) in its Final Report. However, after careful consideration, it decided that it did not want to pre-judge whether this is too large a number. Rather, it determined that it wanted to convey the full set of its findings and recommendations instead of reducing them to an arbitrary number. The Board agreed to wait to hear what, if any, comment from the public and advisory groups on the draft regarding the list of recommendations and, in the end, it did not.

With regards to the priority of the recommendations, the Study Board believes that the Final Report does present its findings and recommendations in some sense of priority with respect to its Directive from the IJC: first, is its consideration of the performance of the 2000 Rule Curves; then, the potential to improve water levels management by means of a new set of rule curves; then, the potential to improve water levels management by means of improved operations; then, moving outwards from the core focus of the Study, to the need for an adaptive management program; and finally, to the broader but vital issue of better engaging First Nations, Métis and Tribes in water levels management in the basin.

IRG Comments provided March 28, 2017

This review covers revised Chapters 1-5 and a number of completed annexes that are being seen for the first time, that were provided to the reviewers on March 24.

The reviewers felt that the new versions of these chapters were greatly improved and addressed the issues raised by the reviewers. The reviewers have the following comments on this latest material.

1. Reviewers recognize that the Study Board had not received their comments on Chapters 7-9 before they provided this draft of the Executive Summary and Chapters 1-5. The reviewers recommend the Study Board revise the Executive Summary and Section 5.5 to take into account the reviewers' earlier comments, particularly on Chapter 9. Similarly, the reviewers recommend taking into account reviewers' comments provided in Chapter 7 when considering Section 5.

Study Board Response:

The Final Report addresses these comments.

2. The reviewers appreciated the revised tables provided in Section 5.2, found the presentation and organization much easier to follow, and valued the additional context leading into summary table 5-1. However, the reviewers feel more work is still required to improve Sections 5.4 and 5.5 so that they are written to the same level of scientific clarity and rigor.

Study Board Response:

The Final Report includes a substantially revised and strengthened section on the comparison of the 2000 Rule Curves and State of Nature.

3. Reviewers have provided comments on those annexes that were fairly complete, but note that three annexes (C, E and H) of the ten have no content and one (F) needs to be updated to reflect the results of the work undertaken during the study. (*Note: annexes have now been ordered by number*)
 - a. For Annex F (*now removed*), reviewers suggest that this updated information include whether or not Study Board responses (including from adaptive management) will fully address the concern raised; additionally, reviewers suggest reframing concerns brought to the attention of

the Study Board to separate any governmentally-oriented indigenous concerns from those raised by non-governmental members of the general public.

Study Board Response:

The Study Board determined that it would be more efficient and helpful to remove this annex and provide it, along with the comments submitted during the public comment period, and Study Board responses to each, on the Study Board website. In this way, the public has access to a complete and current listing of the major concerns received from the various interests in the basin, as of the submission of the Final Report in June 2017.

The Study Board did not believe it was necessary to separate out the concerns raised by Indigenous communities, as these often were integrally linked to concerns about water management in the basin. The recommendations section of the Final Report does separate out the recommendations regarding Indigenous concerns.

Finally, regarding the compilation of public concerns prior to the comment period, it was not the purpose to present any argument or evidence as to whether the Board's responses or recommendations will fully address each particular concern. In presenting a detailed summary of the development and analysis of the alternatives and the comparison of the alternatives against different considerations and tradeoffs, the Study Board believes that it has made clear that its decision-making process and recommendations are both transparent and fair for all the interests.

- b. The Annex E (*Performance Indicators; now 5*) is a critical one from the reviewers' perspective as it is central to the analyses and therefore needs close examination.

Study Board Response:

Agreed. The Study Board always viewed Annex 5 on PIs a priority for the report, and the Final Report includes a thorough summary of the PIs used in the analysis.

- c. Annex G (*now 7*) is well organized and provides useful information regarding the nature of the many studies the Study Board considered and how those studies support the Study Board's conclusions.

IRG Comments provided April 4, 2017

This review covered the revised Chapter 8 and new and revised annexes that were provided on March 31. The reviewers only had a few minor editorial edits on Chapter 8 and feel their earlier limited comments were addressed satisfactorily. Reviewers have the following comments on annexes A-J (minus revised Annex F, which was not provided and is still a work in progress). *Note: annexes are now numbered.*

1. The reviewers have more substantive comments on annexes E (newly received; *now Annex 5*) and G (provided earlier; *now Annex 6*):
 - a. For Appendix E (*now 5*), the reviewers feel it would be useful to put some perspective on the uncertainty for each of the PIs and suggest a qualitative approach could be applied. Reviewers also noted that the origins of the specific criteria used for the PIs are not always stated and suggest; it should be clearly stated for each PI if the specific criteria

comes from a particular study or from existing knowledge (expert judgment). This issue was flagged, but may not have been flagged for all the cases.

Study Board Response:

Regarding the comment on PI uncertainty, the Final Report now addresses this issue of uncertainty in greater detail – the subsection entitled “Model Limitations” has been expanded upon (within Section 3.4.4.). Regarding the comment on the origins of the specific criteria used for the PI development, IERM PIs are described in studies 19 and 21, referenced in the main report where the IERM is introduced (page 58). For the remaining PIs, those based on specific studies are noted, while the remainder (boating reliability and hydropower spill) have explanations provided for their development.

- b. Annex G (now 6) contains 36 PIs, but Annex E describes 28 PIs. Reviewers suggest reconciling or explaining why it is these differ.

Study Board Response:

Annex G (now 6) lists all study subjects investigated by the Weight of Evidence analysis. Performance Indicators (PIs) could only be developed for the study subjects where a direct mathematical relationship could be established between the performance of the study subject and lake levels over time. For example, although the WOE was used to evaluate the performance of adult fish populations pre- & post-2000 Rule Curves, there exist too many outside factors (such as water quality, predation, fishing regulations) to confidently produce a model that predicts the growth or decay of adult fish populations as a response to water level changes.

IRG Comments provided April 25, 2017

This review covered revised Chapter 5, 7 and 9 and revised Annex 5. The reviewers have the following general comments on these chapters and annex.

1. Chapters 5 and 7 contain too much detailed information that is more suited for an annex. These chapters should synthesize information and refer readers to an annex for the details. These chapters could then be pared down to reasonable size (*i.e.*, 30-40 pages). Chapter 7 in particular at 92 pages loses the reader in the endless graphics. The material is very useful and pertinent but is better used to support the findings than being part of the main report. In addition, the temporal variability now captured in the graphs is useful, but makes it more difficult for the reader to retain an overall sense of the outcome over time, across alternatives and in relation to other PIs. In general, it may be helpful to place a considerable amount of technical information in annexes that are segmented from the main report, but not handled/bound separately in order to ensure that it is always available in conjunction with the main report.

Study Board Response:

The Study Board agrees that Chapter 7 is a lengthy chapter. However, on balance, it concluded that it was important for the Final Report to demonstrate, in a comprehensive and transparent manner, how it arrived at its findings and recommendations. The Board believes that the chapter is well organized and flows in a clear, logical and consistent manner through the alternatives under consideration.

The Study Board did not hear from any advisory groups members or during the public comment period that these chapters are too lengthy, and so have decided to leave it as is. It did, however, provide more

summary information in the Executive Summary, within Chapter 7 and provided summary graphics to help the reader understand the findings of the chapter more clearly.

2. Annex 5 needs to be laid out so it is consistent with how PIs are referred to through the main report. It is important to follow the same convention and be consistent with how the PIs are presented.

Study Board Response:

The Final Draft Report presents the PIs in a similar fashion as the main body of the report. PIs are grouped within the same themes as the WOE and are consistent with Chapters 5 and 7.

3. In Annex 5, several PIs are flagged as being “difficult to comment on whether a change in PI value represents a positive or negative change”. This appears to discount such a PI’s usefulness for decision-making purposes, and so it is important for the reader to understand that in the report when presenting results for these PIs, as helpful.

Study Board Response:

The intent of this paragraph is to underline that the true performance of any one PI cannot be fully captured in a single number. Due to the complex nature of ecosystems, other considerations, such as the diversity of plants species, may be as or more important than abundance. Furthermore, in the case of submerged vegetation, a balance of areas of low, medium and high densities may be desirable to support a variety of fish and invertebrate species.

4. Chapters 5 and 7 would benefit from a synthesis of the information presented, perhaps in a single chart as was done for the WOE analysis. Since PIs have been identified as “positive change” or “negative change” (or, for any PIs that cannot be so characterized, “not conclusive”), this would be one possibility for presentation in such a chart.

Study Board Response:

The Study Board has provided graphics to summarize PI performance for each rule curve alternative. These graphics can be found at the end of Chapter 7 (Section 7.6), which summarizes key findings in the evaluation of alternative rule curves.

5. The report would benefit from a description of uncertainty regarding PIs. Ideally, more uncertain PIs would be flagged. At minimum, should the reader assume that comparing a single PI across various alternatives is less uncertain than comparisons among PIs?

Study Board Response:

Many PIs were derived from or are based on the peer-reviewed studies listed in Annex 6. Of particular importance are Studies 19 and 21 that describe the IERM model setup and output. The Study Board invites interested readers to refer to these studies. Chapter 3 of the Final Report contains a section on “Interpretation of PI performance” and has been expanded upon (specifically, Section 3.4.4) to better explain to the reader that the Study Board considers comparison of outcomes for individual PIs under different alternative rule curves to be more reliable and informative than comparing the outcomes between different PIs.

In addition, the report now addresses this issue of uncertainty in greater detail – the subsection entitled “Model Limitations” has been expanded upon (within Section 3.4.4.).

6. In Chapter 7, the section on climate change is acknowledged as a draft in progress, and the reviewers look forward to the completed text, to include information regarding how the scenarios developed are related to climate science and why they were selected. Similarly, the reviewers look forward to the final text regarding key findings. Initial comments have been included notwithstanding the draft nature of the text.

Study Board response:

The Final Report includes an overall discussion on the uncertain future impacts of climate change on water levels and flows in the Rainy River basin and on the potential for addressing this uncertainty by means of rule curves.

IRG Comments provided June 23, 2017

This review covers the draft report and annexes dated June 16, 2017 and notes a few issues that were identified in previous reviews that have not been addressed. These issues do not affect the results and recommendations, but would help to improve the overall quality of report.

1. Chapter 7 at 85 pages is far too long. It contains extensive graphics that are better suited to be in an annex. The reader does not need to be subjected to all these graphs unless they are specifically interested and would then go to the annex. We acknowledge that this is useful information, but not essential to be in the main report. The chapter should only contain the key findings that have been extracted from all these graphs.

Study Board Response:

This comment has been addressed above in two locations in answer to previous, similar comments.

2. The report would benefit from providing the reader with some caveats or statistical relevance with the various Performance Indicator (PI) results computed by the Shared Vision Model (SVM) and Integrated Ecosystem Response Model (IERM). It would be helpful to indicate the significance and uncertainty of changes within and between PI. However, the report does now note that the SVM and IERM do not produce measures of uncertainty or error associated with PI outcomes, and the reliance must be placed on expert judgment to evaluate overall impact to a particular interest.

Study Board Response:

The report now addresses this issue of uncertainty in greater detail – the subsection entitled “Model Limitations” has been expanded upon (within Section 3.4.4.).

3. How do you get from Alternative C to target option? Graph of option appears to connect to 2000 Rule Curve, not Alternative C; presumably it connects through upper band of 2000 Rule Curve in Feb-Mar.

Study Board Response:

In those years where the flood reduction target is employed, the decision would be made in early March. The target would be effective April 1, therefore there is time for the operators to achieve the level reduction and within the normal Rule Curve range to be in the low target band as of April 1. No alteration was made to the report text.

4. Why does the Study Board state: “On Rainy Lake, however the cattail invasion has been worsened by operation under the 2000 Rule Curve”?

Study Board Response:

In response to this comment, the Study Board revisited the IERM and the WOE matrix and decided to make a revision to the matrix from what appeared in the draft report of June 16. The Study Board recognizes that the extent of invasive Hybrid Cattail continues to expand and threaten native species on Rainy Lake, but model results have shown that this expansion would have continued under the 1970 Rule Curves. Therefore, the impact of the 2000 Rule Curve on cattail invasion in Rainy Lake has now been changed to neutral in the WOE matrix. Changes have also been made to the final report text to better explain the Study Board’s decision for a “neutral” classification on Namakan Lake.