ECONOMIC SURVEY TO DETERMINE THE EFFECT OF THE 2000 RULE CURVES ON RESORTS ON RAINY LAKE AND NAMAKAN RESERVOIR

Prepared for the International Joint Commission

by

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EXECUTIVE SUMMARY

PLAN OF STUDY AND METHODS

The Plan of Study (POS) for the Evaluation of the International Joint Commission (IJC) 2000 Order for Rainy and Namakan Lakes and Rainy River was completed in 2009. The POS identified the need for an *Economic survey to determine the effect of the 2000 rule curves on resorts on Rainy Lake and Namakan Reservoir*. The POS lists the following Key Research Question: "What have been the actual economic impacts of the 2000 rule curves on resorts based on Rainy Lake and Namakan Reservoir? It was hypothesized that the 2000 rule curve for Namakan Reservoir would not only benefit the biological system but would also have a positive economic effect on resorts on the reservoir." Accordingly, this study focuses on the economic impact on resorts due to changes in the suitability of water levels for navigation and recreation as a result of the change in rule curves in 2000.

The POS lists the following Recommended Method: "An economic survey of the impact of the rule curves on tourism resorts on both Namakan Reservoir and Rainy Lake should be conducted. The survey should be designed so that the results reflect the impacts over several years, rather than just one year that may reflect an extreme hydrologic condition. The survey must focus on discerning the incremental impact of the 2000 rule curves versus the 1970 rule curves, rather than just the absolute impact of the 2000 rule curves."

The primary data gathered to understand the economic effects on resorts was collected by surveying resorts in the study area. Both monetary and non-monetary measures of the favorable or unfavorable effects of the changes in the rule curves were provided by study participants. Greater comprehension of potential tourism impacts was facilitated by interviewing a sample of long-time customers as well.

RESULTS
Results from the Owner Interviews

All 67 businesses participated in the study, with two that only provided partial responses due to recent or anticipated ownership changes. Twenty-seven percent did not have experience with the tourism industry in the study area before the 2000 rule curves were implemented.

Owners were asked about the importance they place on five conditions: water levels, water quality, walleye habitat, northern pike habitat and wildlife habitat. All five conditions were rated as highly important by the typical owner. Next owners were asked if they agreed that the rule curve goals for water levels, water quality, and fishing quality had been met. On all three measures the typical owner slightly agreed that the goals had been met. The typical responses to these two series of questions yield encouraging results in that there is slight agreement that the rule curves are delivering on goals that are deemed important. Owners described specific ways water levels impacted opportunities for water-based recreation and use of shoreline infrastructure. Comments were categorized by whether the conditions occurred in high or low water. The pattern of responses varied by lake: owners on the Namakan Reservoir tended to only cite problems with low water while businesses on Rainy were more likely to cite problems with high water.

The main non-monetary measure of impacts of water levels is the overall rating of the impacts of the 2000 rule curves from strongly favorable to strongly unfavorable. Over 60% answered strongly favorable or favorable with another 23% split evenly between unfavorable and strongly unfavorable. The typical response was supportive of the changes in the rule curves.

However, perspectives differ between the typical owner on the Namakan Reservoir (quite favorable) versus those on Rainy Lake, (mostly unfavorable.) Significant differences also exist between owners grouped by lake in the level of agreement that the goals are being met.

Verbal comments made by resort owners during the interviews enrich the quantitative data and enhance understanding of respondents' views, particularly for those who experienced economic impacts but could not express them monetarily.

Results from the Customer Interviews

Interviews were conducted with long-time customers, defined as those with experience under the old and new rule curves. Nearly half of the 53 customers were interviewed in person while the interview team was at the business. The other half were interviewed via telephone, US mail or e-mail. Customer responses were similar to the owners in that a great deal of importance was assigned to all five features. The typical customer slightly agreed that the goals had been met. The explanations of these ratings and the descriptions of problems with high and low water enhance understanding of these perspectives. As with owners, the sensitivity of customers to low or high water differed between lakes. Customers were also asked about the degree of favorability of the rule curve changes overall with 76% answering strongly favorable or favorable with another 13% being neutral.

Economic Impacts on Resorts

Of the sixty seven responses from owners of resorts, houseboat companies, outfitters and marinas, fifty nine included comments pertaining to economic impacts of water levels. Twenty owners described positive impacts on their businesses due to the 2000 rule curves. But only six were capable of quantifying these effects in dollar terms amounting to $444,000 in additional customer spending. Six owners described losses from high water on Rainy Lake occurring some years from 2001 - 2013 including four that enable economic estimates. Losses during the average high year totaled to $79,000 less spending at three Ontario resorts and $36,000 less at one MN resort.

Many resorts reported lost sales due to high water in 2014. Twenty-two businesses reported negative impacts on sales due to the high water of 2014 with fifteen providing quantitative evidence. These figures are separate from the damages to infrastructure. Seven resorts reported lost occupancy totaling to 34 weeks causing $102,000 less in lodging revenue. and the other eight reported lost sales of $605,000 in 2014. Combined with lost occupancy the total loss in sales at resorts in 2014 comes to $707,000.

These losses in 2014 need to be regarded differently than the gains and losses reported in years prior to 2014. The gains from ample water in spring on the Namakan Reservoir are recurring benefits targeted by the rule curve changes. Losses on Rainy Lake not anticipated in the POS are recurring when levels exceed the maximum levels set forth in the 2000 rule curves. In other words, the recurring gains are due to improved RC ranges, the losses result from levels outside the curves. And 2014 is in a separate category of exceptional circumstances.

Data on the Explore MN website provided in collaboration with the MN Department of Revenue is useful for tracking past tourism trends to see if the market share of tourism sales in the study area has changed relative to sales in the NE region. Gross sales at Resorts in NE MN from 2004 – 2011 vary between just over $74 million to peaks nearing $81 million. When adjusted for inflation the trend is for a slight decrease in real tourism spending in the region. Tourism Receipts in Ontario show a drop in 2003 followed by an upward trend without an

evident decrease around the recession 2007 – 2009, with a slight overall downward trend since 2000 when adjusted for inflation.

The three lodging tax jurisdictions in the study area, Crane Lake, Kabetogama and Koochiching County, all have data on lodging tax receipts going back to the 1990s, though the time periods vary. All three areas show a stronger, more consistent performance compared to gross sales at resorts in NE MN. Lodging facilities around International Falls expanded summer-winter lodging receipts by nearly two thirds from 1999 to 2011, but spring sales (May + June) were quite flat, which is consistent with owners' descriptions of difficulty accommodating customers during several Junes since 2000. Spring receipts for Kabetogama show strong growth by roughly doubling over the last two decades and far surpassing the inflation rate. Business for the other ten months has expanded even more driven largely by large increases in sales in July, August and September. From 1995 – 2005, Crane Lake showed immense growth in spring lodging tax receipts from under $5,000 in the mid-to-late 1990s to nearly $20,000 in the early 2000s, which is a statistically significant upward trend even when adjusted for inflation.

DISCUSSION AND IMPLICATIONS

The results show that important features were included in the interview protocol and the typical customers and owners agree that the goals for improvement in the rule curve changes are being met. The impacts of the 2000 rule curves are seen as strongly favorable by owners on Kabetogama and Crane Lakes driven by relief from the problems with low levels in spring that were allowable under the 1970 rule curves.

The negative impacts on Rainy must be recognized as occurring due to levels above the upper bound of the 2000 rule curves (2000 RC max) and so are not technically due to the rule curves, but rather to water levels being outside of them. In contrast the improvements reported by those on the Namakan Reservoir who appreciate the higher spring levels result from changes that are an expressed purpose of the new management policy.

KEY FINDINGS

- Ratings from both owners and customers indicate that the goals in the changes are deemed important, general agreement that the goals have been met and customer satisfaction with the recreational experiences. For the most part, the policy is delivering what respondents find to be important.
- Average responses on the favorability of the changes resulting from the 2000 rule curves are very supportive. Yet the distributions show variability with Namakan Reservoir owners rating changes as favorable to strongly favorable) while the average for Rainy Lake respondents is on the unfavorable side of neutral.
- Inferential statistics on level of agreement that the goals are being met also demonstrate that there is a significant difference between those whose businesses are on the Namakan Reservoir and those on Rainy Lake. Despite little change in the rule curves on Rainy there is much less support and agreement that goals have been met there. Objections are not only with the extremes this summer but even in prior years with negative impacts reported from high and rapidly rising water levels in June.
- The evidence from lodging tax receipts complements the sales and occupancy data provided by resort owners in demonstrating a strong positive economic impact on resorts in spring due to higher water levels on the Namakan Reservoir.

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INTRODUCTION AND PURPOSE OF STUDY

In 2001 the International Joint Commission (IJC) issued an Order prescribing the method of regulating the levels of the boundary waters of Rainy and Namakan lakes, consolidating and replacing a number of previous orders and supplementary orders (International Joint Commission 2001). This "Consolidated Order" was effective on February 28, 2001, and contained the following provision: "This order shall be subject to review 15 years following adoption of the Commission's Supplementary Order of 5 January 2000, or as otherwise determined by the Commission. The review shall, at a minimum, consider monitoring information collected by natural resource management agencies and others during the interim that may indicate the effect of the changes contained in the Supplementary Order of January 5, 2000."

In 2007, the IJC formed a Rule Curve Assessment Workgroup to develop a plan of study (POS) in which the Workgroup would prioritize the monitoring and analyses required to review the IJC Order in 2015. Specifically, the POS was written to identify priority studies and describe information/data that remained to be collected, identify what entities might collect the data and perform the studies, and to provide an estimate for the cost to accomplish this work by 2015. The Plan of Study (POS) for the Evaluation of the International Joint Commission (IJC) 2000 Order for Rainy and Namakan Lakes and Rainy River was completed in 2009 (Kallemeyn et al., 2009).

This study is identified in the POS and is described as an *Economic survey to determine the effect of the 2000 rule curves on resorts on Rainy Lake and Namakan Reservoir*. The Scope of Work (SOW) for this study is listed in the POS as number one of SOWs to be completed in Annex 1 to the Cooperative Agreement between the USDI-National Park Service Voyageurs National Park (VNP) and the IJC, Agreement No.-1042-100732.

Scope of Work

The SOW for this research adopts its purpose from the 2009 POS. The title of this report is also adopted from the POS:

"Economic survey to determine the effect of the 2000 rule curves on resorts on Rainy Lake and Namakan Reservoir"

The POS lists the following Key Research Questions:

"What have been the actual economic impacts of the 2000 rule curves on resorts based on Rainy Lake and Namakan Reservoir? It was hypothesized that the 2000 rule curve for Namakan Reservoir would not only benefit the biological system but would also have a positive economic effect on resorts on the reservoir. The benefits would accrue from the earlier spring rise, which would increase the seasonal availability of docks and boat launches and improve navigation, and the summer drawdown, which would reduce the frequency of damage to docks and shorelines from above normal precipitation, particularly during fall equinox storms. Effects on the resorts on Rainy Lake were projected to be much smaller due to the relatively minor changes in the rule curve."

This study focuses on the economic impact on resorts due to changes in the suitability of water levels for navigation and general recreational activity as a result of the change in rule curves in

2000. The potential economic impact on resorts is conceptualized here as emanating from possible changes in recreational demand that could impact tourism activity due to changes in water levels. Any changes in recreational and tourism activity resulting from the difference between the 2000 and 1970 rule curves will be evaluated as <u>direct expenditures which would impact the profitability of resorts</u>.

METHODS

Estimating Economic Impacts

       As noted above, the primary data that forms the basis for understanding the economic effects on resorts was collected through a survey of resorts in the study area. More general, non-monetary measures of the favorable or unfavorable effects of the changes in the rule curves were also provided by study participants. The dollar estimates of economic impacts are founded on statements from resort owners on changes in sales or in occupancy and visitor days, that are an intermediate step resulting in changes in sales. Changes in direct expenditures due to water levels are summarized as reported by resort owners. As prescribed by the POS and the SOW, these changes in direct expenditures at resorts are the primary focus for quantifying monetary impacts. Because direct changes in tourism spending are often translated into overall regional economic impact, these measures are also approximated. Based on findings in the literature recommended by tourism researchers at Explore Minnesota and the Ontario Ministry of Tourism, Culture and Sport, Tourism Research Unit, conversion factors are utilized for extrapolating changes in resort spending to changes in overall direct expenditures in the area economy. These sources are also the basis for applying an economic impact multiplier to approximate total economic impact on the region measured as dollars of economic activity.

       A few of the resort owners shared their own estimates of how lodging expenditures convert into total direct spending at their business. Otherwise, estimates from the literature shown in the References section form the basis for these conversion factors and an economic impact multiplier. (Explore MN, 2010, 2012; Fulton, et al, 2002; Henry and Welle, 1987 and 1988; MN Revenue; Ontario Ministry of Tourism, Culture and Sport)

       The quote above from the POS on key research questions notes the intent of summer drawdown to reduce damage to docks and shorelines. This study includes those effects on recreational infrastructure only to the degree that they impact suitability for recreation. Voyageurs National Park staff recommended coordination and delineation of analysis of these impacts in relation to a separate study on infrastructure and shoreline impacts on private property, which include both resorts and other riparian property owners. Communication and collaboration with Mike Shantz of Environment Canada, who is conducting the study on infrastructure impacts, has led to the understanding that his analysis will quantify monetary effects on infrastructure. So as not to double count these infrastructure impacts, those dollar figures on damages are excluded from this scope of work on tourism. Economic impacts of infrastructure damages are only included here to the extent that they were severe enough to influence tourism sales.

       This study and the Shantz study rely on hydrological analysis performed by Aaron Thompson of Environment Canada. Results on infrastructure impacts through 2013 were available from the Shantz study in advance of surveying resorts on recreational and tourism impacts during the summer of 2014. This allowed resort interviewers to guide respondents to

distinguish dollar values for infrastructure itself from the ways infrastructure changes impacted recreation and tourism. For example, docks temporarily rendered unusable can detract from some forms of water-based recreation. (It is noteworthy that other forms of recreation could benefit, such as high water possibly enhancing fishing success.) Impacts on recreation are included in this study; the costs of repairing damaged infrastructure are not. Sequencing the two studies in this way helped to distinguish infrastructure values from tourism impacts and also was intended to avoid burdening resort owners with two distinct studies at the same time.

The high water of 2014 undermined the latter goal in that infrastructure damages were so severe that the sample of resorts and riparian property owners included in 2013 were deemed inadequate to understand the damages in 2014. In early July of 2014 the tourism interview protocol was augmented to explicitly ask about 2014 infrastructure damages that may have caused losses in sales and to highlight that the infrastructure damages themselves were being tabulated in the Shantz study. Resort owners were given a reporting sheet with contact information so that they could submit these figures to Mike Shantz when the aftermath was known. This added effort generated further evidence for the Shantz study and also clearly distinguished that only impacts on sales would be included in the tourism study.

Distinguishing Between Impacts Related and Unrelated to the Rule Curves

The POS lists the following Recommended Method:
"An economic survey of the impact of the rule curves on tourism resorts on both Namakan Reservoir and Rainy Lake should be conducted. The survey should be designed so that the results reflect the impacts over several years, rather than just one year that may reflect an extreme hydrologic condition. The survey must focus on discerning the incremental impact of the 2000 rule curves versus the 1970 rule curves, rather than just the absolute impact of the 2000 rule curves. Extension of the hydrologic modelling work accomplished for the 1999 IJC Rule Curve Study for Rainy Lake and Namakan Lake, through 2008, will be useful to determine comparative lake elevation differences under the two rule curve sets. Field surveys using these differences can then be applied at each resort and combined to estimate the overall economic impact to tourism. Because of the differences in the projected hydrological and associated economic effects, survey results from the two systems should be compared to identify other factors that may have influenced the resort economy."

As noted above, quantifying the tourism impacts is based on the differential impacts of the 2000 versus 1970 rule curves. The method is not limited to solely evaluating the absolute effect of the 2000 rule curves in isolation but rather the effects of the differences in the rule curves from 2000 and 1970. The hydrological work by Aaron Thompson was incorporated in background materials for the interviews to focus on potential impacts of elevation frequency and duration. In advance of interviews at resorts, the Thompson analysis was summarized into lists that identify quarter-month periods in which critical elevation levels occurred since the 2000 rule curves (2000RC) were implemented, categorized as periods above the allowable maximum (RC Max) or below the allowable minimum (RC Min). The model also indicated quarter-month periods in which water levels would have been outside the allowable ranges for the 1970 rule curves (1970RC). The lists of periods that were outside the rule curves for Rainy Lake and the Namakan Reservoir are provided in Appendix E. One list is for the 2000RC and the other is for

the 1970RC. The 1970 list also shows discrepancies between the 1970RC and 2000RC by highlighting periods when water levels since 2000 would have been outside one set but not the other. These lists were brought as reference materials for the interviews. The hydrological work is also being relied on to identify weather-related extremes that would have occurred under either the 1970 or 2000 rule curves.

Respondents were encouraged to distinguish impacts from fluctuations in water levels resulting from weather extremes that would have occurred regardless of the rule curves, though conducting interviews in the field while the 2014 flood was unfolding made this difficult to discern and rather touchy. Respondents were asked to focus on discernible impacts (favorable or unfavorable) of lake elevation on water-based recreation that occurred under the 2000 rule curves that would not have under the 1970 rule curves. Respondents with sufficient history were also asked to identify impacts that occurred under the 1970 rule curves that were avoided due to the 2000 rule curves.

Again the hydrological work identified these two possible scenarios and linked them to the relevant quarter-month periods for these elevation levels. The two-fold definition of critical elevation levels presented in resort interviews was: 1) elevation levels since 2000 that were outside of the upper or lower bounds of the 1970RC, 2000RC or both and 2) avoiding extremes since 2000 that would have been allowed under the 1970 rule curves. In other words, critical periods since 2000 were identified as those that were outside the RC and those that were avoided because the 2000RC required different ranges. The POS places special emphasis on spring lows that were allowed under the 1970 RC Min but not under the 2000 RC Min. Additional visual aids that were available for the interviews showed the 1970 RC Max and Min and the 2000RC Max and Min throughout the year for both Rainy Lake and the Namakan Reservoir. These are provided in Appendix D.

These methods were developed to capture very technical and complex information needed to accurately distinguish differential impacts of the two sets of rule curves (2000 vs. 1970) on the two lake groups in a manner that would be as understandable to respondents as possible. The illustrations of the two sets of curves (Appendix D) aided in communication of these complexities and were referred to in numerous interviews. Rather than delving into the intricacies of periods outside of one rule curve or the other as shown in Appendix E, the conversations in interviews tended to boil down to more understandable patterns of differences due to the 2000 curves: relatively higher spring lows on Namakan, faster summer drawdown to relatively lower lows into fall on Namakan and faster rises to early summer highs on Rainy Lake.

Combining these two possible hydrological scenarios with the two possible economic impacts (benefits or damages) yields four possible combinations of differential effects: (a) benefits to tourism that occurred under the 2000 rule curves that would not have occurred under the 1970 rule curves, (b) damages to tourism that occurred under the 2000 rule curves that would not have occurred under the 1970 rule curves, (c) benefits to tourism that occurred under the 1970 rule curves that did not occur under the 2000 rule curves, and (d) damages to tourism that occurred under the 1970 rule curves that were avoided due to the 2000 rule curves, Effects (a) and (d) are gains due to the 2000 rule curves and (b) and (c) are gains due to the 1970 rule curves.

The net effect of the 2000 rule curves (expressed as gain or loss in tourism expenditures) is expressed as the gain due to the 2000 rule curves minus the gain under the 1970 rule curves, such that the net effect = a + d – b – c. A more encompassing definition of benefits often used by economists would include among the benefits of one scenario the <u>damages avoided</u> from the

other scenario. So a simpler formulation to derive the net benefits of the 2000 rule curves would be the relative benefits under the 2000 rule curves minus the relative benefits under the 1970 rule curves, recognizing that net benefits can be negative, indicating a loss. This difference will be positive if the 2000 rule curves resulted in more tourism expenditure compared to the 1970 rule curves and negative if the opposite is true.

While remaining true to these conceptual distinctions, the practical method implemented in the interviews resulted in respondents citing the patterns of relative differences highlighted above using the new conditions as the reference point: benefits of higher water in spring on Namakan, losses from too low of drawdown on Namakan in dry summers and losses from too fast a rise in May and June on Rainy. The methods also allowed differentiation of effects due to changes in the curves from those that occurred when water levels were outside of the curves, such as levels above the RC max on Rainy during several summers from 2001-2013 and especially during the flood of 2014.

As noted above, the hydrological work by Thompson allows identification of critical quarter-month elevation levels in the year in which they occurred. Based on evidence provided in the interviews, net effects on tourism are chronicled by year since 2000 with distinctions drawn between typical effects since 2000 and atypical effects that occurred in a certain year. Some interview respondents described impacts that are inconsistent with the hydrologic evidence, especially impacts unrelated to the rule curves such as those resulting from extreme weather periods. These impacts are recorded but not included in the estimates of tourism impacts.

Surveying at Resorts: Resort Owners and Their Long-Time Customers

As shown above, the recommended method in the POS is a survey of resorts. The primary method employed was in-person interviews with resort owners about the impacts of the rule curves on their businesses. Surveying resorts to discern tourism impacts focuses on the suppliers of this economic activity. But greater comprehension of potential tourism impacts is facilitated by understanding the demand side as well. Interviews of a sample of long-time customers were added as a method in this SOW. Resorts as suppliers are likely to feel the tourism impacts as a change in the behaviors of their customers. But resort owners may not be immediately in tune to effects on recreational enjoyment or a lag may occur in this chain reaction. By the time tourists quit coming due to less suitable water conditions, it may be too late. The goal of the 2000 curves to enhance the suitability of lake elevations for boat access and navigation should be manifested in more tourism due to more satisfied visitors. If achieved, the goal of improving walleye spawning conditions could also result in a positive change in tourism. Interviewing repeat visitors allowed for the corroboration of changes observed by resort owners with the perspectives of their customers. In addition to being interviewed themselves, resort owners were asked to suggest up to five repeat customers, preferably with experience before the 2000 rule curves were implemented, to be interviewed on the impacts of the 2000 rule curves on their recreational enjoyment compared to the 1970 rule curves.

The Population of Resorts
The POS established the focus of investigating the economic impact on resorts. Rather than interpreting resorts too narrowly, "resort-like" businesses such as houseboat companies, full-service marinas, and guides and outfitters with accommodations were also included in the population. The interpretation excluded motels and campgrounds located away from the water

that are not predominantly driven by water-based recreation. Compiling and cross-referencing multiple lists from tourism organizations on both sides of the border led to a list of 67 businesses in the population. The list and a map of locations are provided in Appendix A4.

The goal in the SOW was 100% participation of resorts in this study. This goal was achieved with two resort owners only providing responses to some of the questions being an ownership change had occurred recently or was anticipated. To maximize participation, flexibility was provided in both the timing and mode of delivery of the interviews. In-person interviews were the preferred method and were conducted for the vast majority of resorts, but for a handful of owners interview protocols were provided by mail or e-mail. Two responded by mail, one via e-mail and three provided their answers over the phone. The 100% participation rate indicates the importance of this topic to their businesses and a high level of motivation to provide information for this study.

The Sample of Long-Time Customers

Long-time customers were defined as those having experience with water-based recreation on study lakes before and after the 2000 rule curves were implemented. The emphasis was on resort guests but a handful of customers that were recommended were not actually using overnight lodging at the respective business, but were deemed to be valuable customers just the same.

Flexibility was also provided in gaining information from resort visitors. It was difficult to time visits to resorts to coincide with when the most knowledgeable customers were there. This was made even more difficult by the high water levels from mid-June until late July or into August on study lakes. It was necessary to rely on resort owners to refer customers to the interview team and to facilitate interviews with the customers they recommended, such as providing contact information. The crisis of high water that many resort owners had to deal with and manage on behalf of their customers made it too intrusive to remind them to refer customers to be interviewed. But as the season was winding down in the fall some resorts provided contact information so more interviews could be conducted than occurred at the resorts. The target sample size for the study was interviewing up to 60 (and no fewer than 45) long-time visitors with sufficient knowledge of differential water conditions between the two sets of rule curves. Responses were received from 53 long-time customers during the sampling period ending mid-November 2014.

Interviews with customers served to corroborate information from resort owners and also enriched the evidence on the background resort economy. Data on local and regional tourism trends is available from sources listed in the References and reported in the last section of the Results. This information provides important context for the influences on tourism indicated by responses from resorts and their customers. Differential impacts of the 2000 and 1970 rule curves are separated from trends in tourism resulting from other factors.

The Survey Instruments

The two survey instruments, visual aids and other support material are provided in the appendices. The owner interview protocol is contained in Appendix A1 and the customer form is provided in Appendix B1. As mentioned above, various methods were used for resort owners to report the impacts of the rule curves on their businesses. The main focus was on conventional economic measures such as dollars of sales or visitor days, but Likert scale measures of the importance of rule curve goals, agreement that the goals had been met and ratings of the

favorability of the rule curve impacts were also utilized. (Likert scales measure attitudes and intensity of feelings, such as levels of agreement or disagreement, traditionally using a 5-point scale: Likert, 1932.) The economic impacts on sales or costs of doing business are not easily quantified or tracked for many tourism businesses, so more open methodologies were also made available for resort owners to communicate the impacts of the rule curves. These impacts are sufficiently complex to warrant extensive explanation of responses through open-ended comments. By asking respondents to explain the impacts verbally more rich and comprehensive evidence was collected. In many cases non-monetized aspects of operating a business result from the type of policy change being evaluated here. Tracking bottom-line impacts in dollar terms can be difficult for many businesses, but the overall conditions for serving customers can be measured in various ways. The design of both of the survey instruments reflects this flexible methodological approach. In some cases, resort owners were capable of providing all of the multiple dimensions for measuring the impacts of the rule curves in both monetary and non-monetary terms. For others who could not report one or more of these measures, having them communicate alternative measures led to a more satisfactory and fulfilling interview experience. The interviews also gathered background information on the business, including years of experience in the area's tourism industry.

The customer survey asked for many of the same measures of importance of goals and agreement that goals had been met, favorability of impacts along with Likert scale responses of the satisfaction with various aspects of the visitor experience. The economic measures fit the role of consumers rather than the sellers' side emphasized in the owner questions. Background characteristics were also gathered in the customer interviews.

Pre-Testing and Peer Review

Extensive pre-testing of the interview protocol and reference materials was conducted with officials involved in the POS and other anticipated users of the results. Pre-testing and review was also provided by experts in tourism research and the tourism industry, and members of the resort community and their customers. The IJC also contracted with an expert in tourism research in the region to provide peer review.

This review was beneficial and resulted in higher quality interview and study design. A particular issue that arose from pre-testing was the difficulty some subjects, even those with experience before 2000, would have in comparing and contrasting impacts due to changes. This concern was perhaps greatest in terms of resort owners providing proprietary information on changes in business activities over the years. Accordingly, the interview protocol was created to be sensitive about proprietary information and to arrange time for a follow-up contact if they could not recall specifics about impacts, especially quantitative measures, so they could review their records if they chose to.

A related concern was how much respondents could be expected to know about the rule curves and the goals for improvements with the 2000 changes. As such both owners and long-time customers were asked to rate importance of various aspects of the lake environment to their business (owners) or their visitor experience (customers.) But the POS is quite specific in prescribing focus on the rule curves and not background conditions that are unrelated to them. In a conventional application of "Importance-Satisfaction" scales that are often used in planning processes or in evaluating management performance, the importance ratings would be followed by satisfaction ratings. But the "Satisfaction" measure pertaining to rule curve goals was altered to measure the level of agreement or disagreement that rule curve goals were being met rather

than satisfaction with overall conditions that might be unrelated to the rule curves. Pretesting and the emphasis provided in the POS suggested that respondents could be asked about implications of water levels directly and their indirect impacts on water quality and fishing, being most are motivated and capable observers of both. But while the importance of wildlife to the visitor experience was asked of both groups, it was deemed to be outside a reasonable threshold to ask if complex, scientific goals for habitat and ecosystem quality had been met.

The use of open-ended follow-ups allowed more flexibility in implementing an interview protocol that could elicit information from the most knowledgeable respondents without over-burdening those with less familiarity or recall. For example, the flexible design provided opportunity for responses about the quality of wildlife encounters even without a question asking specifically if wildlife goals had been met. Similarly, comments on fishing quality could be nuanced by describing observed changes over the years and distinguishing between those related to the rule curves and those due to other factors. Given the anticipation of a large amount of "word-of mouth" communication among potential respondents as the interviews were being conducted in a community, a priority was set to achieve an interview process that was not too long or demanding, yet fulfilling in allowing respondents to provide comprehensive and logical information. Potential respondents in studies such as this deserve the opportunity for a sensible and rewarding interview process, and providing it can be essential to achieving quality results based on adequate participation.

RESULTS

Results from the Owner Interviews

Statistics from Closed-Ended Responses
Many of the results from the interviews with resort owner/operators take the form of descriptive statistics. Percentages of responses (relative frequencies) are shown in Appendix A1 along with the interview questions. Descriptions of results are provided below to complement the quantitative findings. Again it is important to note that all 67 businesses participated in the study, with two that only provided partial responses due to recent or anticipated ownership changes.

Questions on background characteristics initiated the interview process. The answers to Q1 revealed that 97% of these businesses are operated by their owners and the other three percent have operators that are not owners. A considerable amount of turnover in resort ownership has occurred since the rule curves were changed in that about 27% did not have experience with the tourism industry in the study area before the 2000 rule curves were implemented. Those without experience to compare and contrast the rule curves before 2000 were still valuable participants in the study but were screened out of the responses as to whether goals had been met. Figure 1 shows the breakdown of longevity among owner/operators across decades. A handful of owners have experience spanning a half century. A few who responded that they had experience with the industry before 2000 rule curves were implemented did not start in their respective businesses until after 2000.

The frequencies of importance ratings for water levels, water quality, walleye habitat, northern pike habitat and wildlife habitat are shown along with the interview questions in Appendix A1. In order to facilitate visual comparisons, Table 1 shows frequencies of importance ratings on all five conditions.

Figure 1. Year Owner Started by Decade
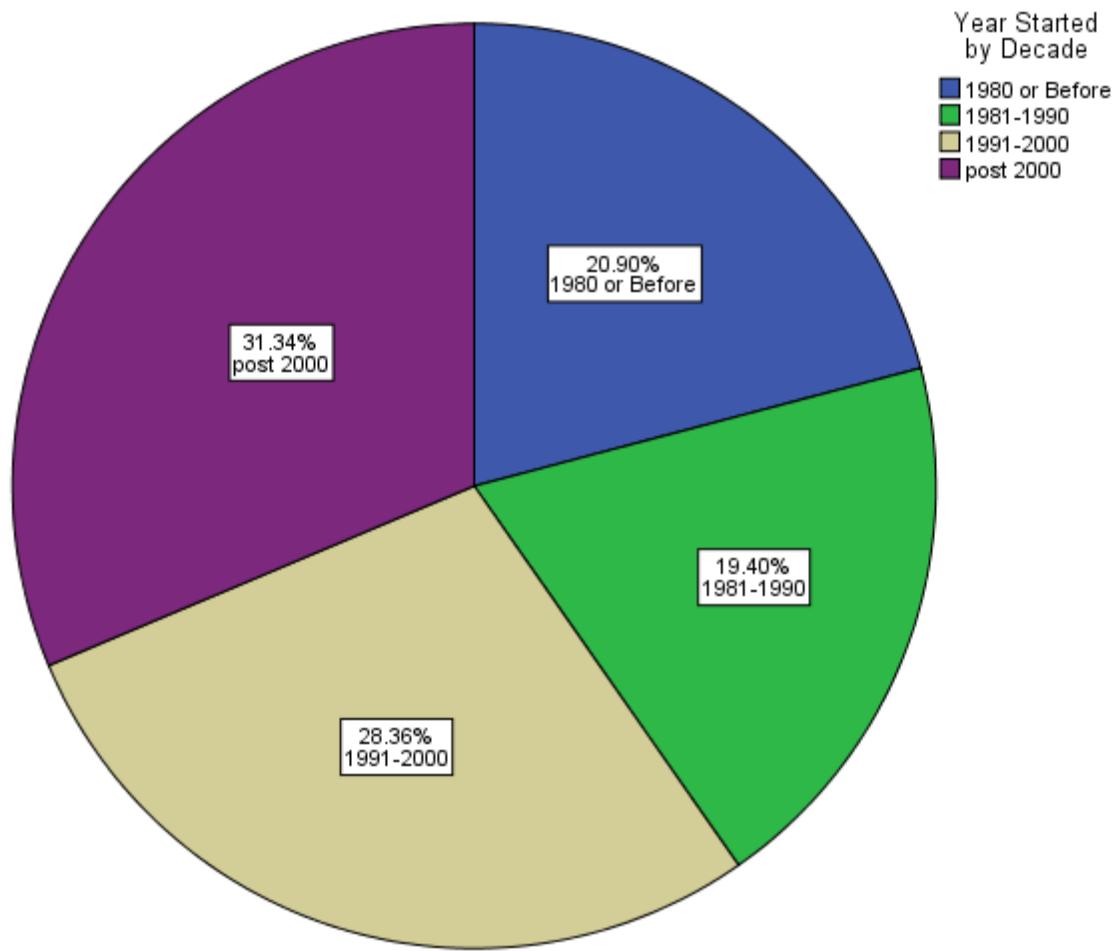
Table 1. Importance Ratings for All Five Conditions

	Water Levels	Water Quality	Walleye Habitat	Northern Pike Habitat	Wildlife Habitat
Not Important At All	0	0	0	0	0
Not Very Important	0	0	0	1.5	1.5
Somewhat Important	3.1	6.2	4.6	26.2	23.1
Very Important	41.5	38.5	41.5	35.4	40
Extremely Important	55.4	55.4	53.8	36.9	35.4
Total	100%	100%	100%	100%	100%
Valid Percent of n = 65					

Importance is rated on a Likert scale so it is conventional to report mean scores as part of an Importance-Satisfaction scale. As explained in the Methods section, the focus here is not broad rating of satisfaction with these conditions but rather whether respondents agree that the goals for improvement with the rule curve changes have been met. Still the responses to the series of questions in Q4 and Q5 enable a hybrid form of Importance-Agreement ratings.

As shown in Table 1, all five conditions were rated as highly important by the typical owner. The means are: water levels = 4.52, water quality = 4.49, walleye habitat = 4.49, northern pike habitat = 4.08 and wildlife habitat = 4.09. Northern pike and wildlife habitat were rated lower in importance but both still average above "Very Important". The open format of the interviews stimulated many open-ended explanations for the responses to the Q4 and Q5 series. The follow-ups in Q5 d - g stimulated respondents to think about other conditions that are important to them and whether they agreed that the rule curves had improved these conditions. The owners' open-ended comments recorded in Appendix A3 provide rich context for the Likert scale responses. These alternative measures complement each other in demonstrating that the conditions listed in the interview are highly important in relation to these business owners and the satisfaction of their customers.

The frequencies of agreement-disagreement for water levels, water quality, and fishing quality are again shown along with the interview questions in Appendix A1. Those without experience with the old rule curves were coded as "missing" for all three parts of this question. Agreement is rated on a Likert scale ranging from Strongly Agree = 5 to Strongly Disagree = 1. All three agreement levels had mean ratings above neutral (3) meaning the typical owner slightly agreed that the goals had been met. The means are: water levels = 3.4, water quality = 3.42 and fishing quality = 3.78. The question of fishing quality did not specify game species but respondents added texture in explaining the species most important to recreational activity. Owners generally talked about the pre-eminence of walleyes to their customers.

Figure 2 provides the general two dimensional grid for Importance-Satisfaction Ratings.

Figure 2. One of Many General Forms of an Importance-Satisfaction Grid
(source: WWW under search heading "Importance Satisfaction matrix")
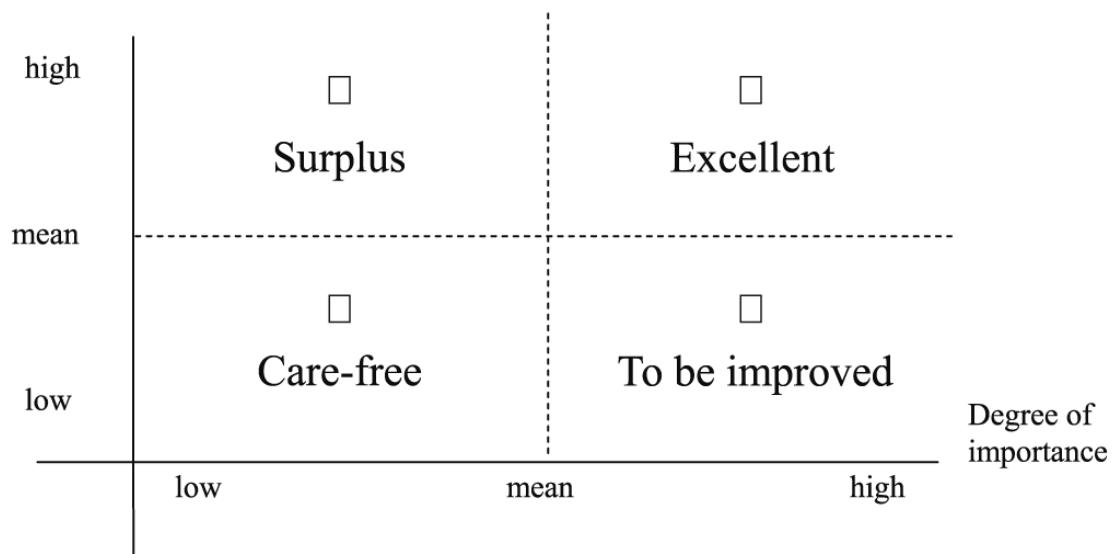
This approach is often used to inform planning or to assess management performance in identifying priority areas for improvement or greater resource allocation. Priorities can be set to improve conditions in the lower right or southeast (SE) quadrant of the grid: the condition is important but not yielding satisfaction. Good management is indicated by conditions in the upper right or NE quadrant. It is termed "Excellent" that conditions that are important are also

yielding satisfaction. If a purpose of the exercise is to guide resource allocation, ratings in the NW quadrant should be assigned low priority as they are yielding high satisfaction on conditions that are not important to people.

Figure 3 inserts the two-dimensional ratings of Importance-Agreement into the grid based on mean responses from owners. It is reassuring that all points are in the NE quadrant, indicating that the rule curves are performing well according to the typical respondent. However it is worth foreshadowing the inferential statistics reported below that demonstrate that there is a significant difference in agreement that the goals are being met between those whose businesses are on Namakan Reservoir lakes and those on Rainy Lake.

Figure 3. Importance-Agreement Ratings by Owners for the 2000 Rule Curves
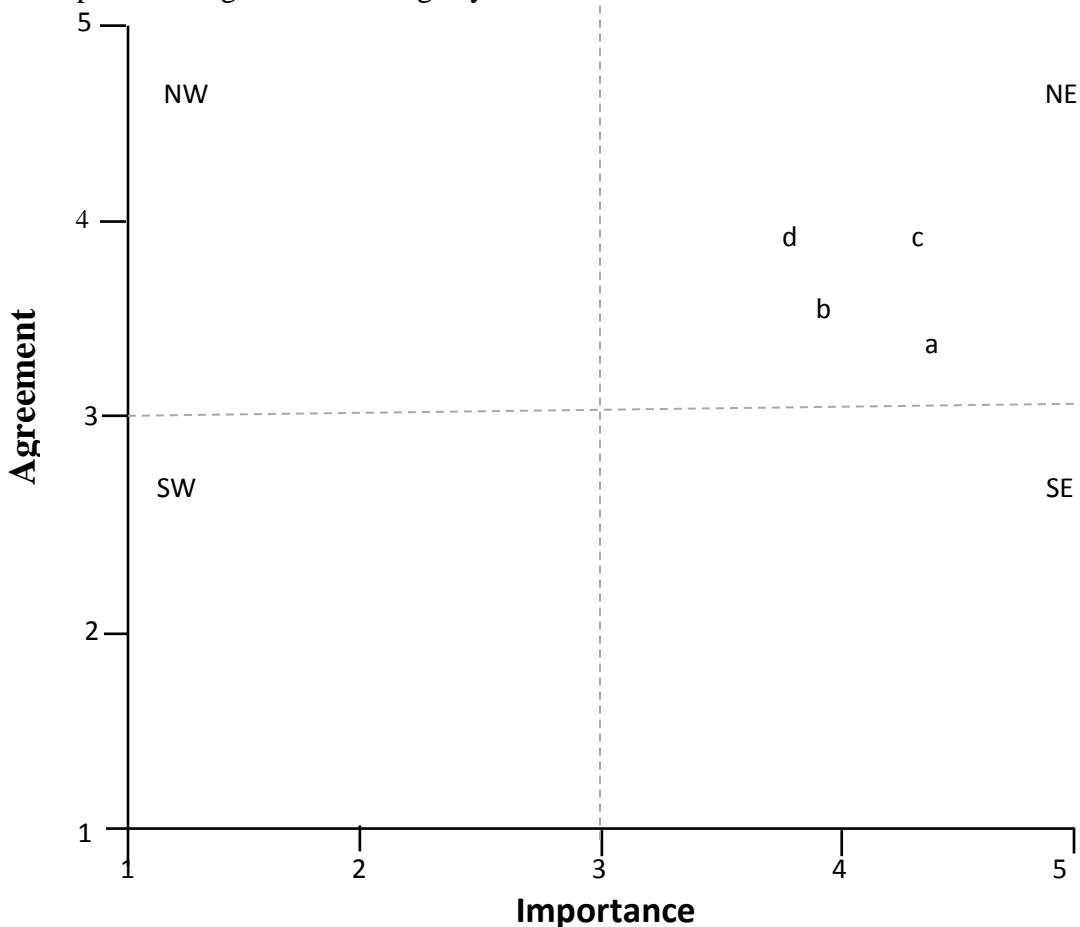
a = water levels, b = water quality, c & d = walleye & N. pike fishing quality

Given the two sets of rule curves for Namakan Reservoir lakes and Rainy Lake one empirical question that emerges is whether the effects of the new rule curves were viewed differently between owners on the two groups of lakes. Being all five conditions were rated as important, it is not surprising that comparing ratings between lake groups (Namakan Reservoir versus Rainy Lake) did not find statistically significant differences using chi-squared analysis. But agreement that the goals of the rule curve changes are being met varies between lake groups. Tables 2 - 4 show crosstabs on agreement that goals are being met for improving water levels,

water quality and the quality of fishing, respectively. All chi-squared tests are significant at the 1% level. The pattern is toward widespread agreement that goals are being met by Namakan owners while Rainy owners tend to disagree. With Likert scales, mean responses are commonly used as measures of central tendency to facilitate the Importance-Satisfaction (Agreement) grids as shown above. However, it can be contentious to compare mean Likert ratings through inferential statistics based on t-tests. T-tests comparing mean Likert scores are commonly found in the literature but this is objectionable to those who interpret Likert scales as merely ordinal

Table 2. Agreement that Water Level Goal Has Been Met Cross-tabulated by Lake Group

Agree water levels			Lakegroup		
					Total
			Namakan Reservoir Lakes	Rainy Lake MN & ON	
Strongly Agree	Count		11	0	11
	% within Lakegroup		39.30%	0.00%	22.90%
Agree	Count		14	3	17
	% within Lakegroup		50.00%	15.00%	35.40%
Neutral	Count		2	2	4
	% within Lakegroup		7.10%	10.00%	8.30%
Disagree	Count		0	12	12
	% within Lakegroup		0.00%	60.00%	25.00%
Strongly Disagree	Count		1	3	4
	% within Lakegroup		3.60%	15.00%	8.30%
Total	Count		28	20	48
	% within Lakegroup		100.00%	100.00%	100.00%

Chi-squared = 30.635, p = .00

Table 3. Agreement that Water Quality Goal Has Been Met Cross-tabulated by Lake Group

Agree water quality			Lakegroup		
					Total
			Namakan Reservoir Lakes	Rainy Lake MN & ON	
Strongly Agree	Count		8	0	8
	% within Lakegroup		28.60%	0.00%	16.70%
Agree	Count		8	2	10
	% within Lakegroup		28.60%	10.00%	20.80%
Neutral	Count		12	13	25
	% within Lakegroup		42.90%	65.00%	52.10%
Disagree	Count		0	4	4
	% within Lakegroup		0.00%	20.00%	8.30%
Strongly Disagree	Count		0	1	1
	% within Lakegroup		0.00%	5.00%	2.10%
Total	Count		28	20	48
	% within Lakegroup		100.00%	100.00%	100.00%

Chi-squared = 15.744, p = .00

Table 4. Agreement that Goal for Quality of Fishing Has Been Met Cross-tabulated by Lake Group

Agree Quality of Fishing			Lakegroup		
					Total
			Namakan Reservoir Lakes	Rainy Lake MN & ON	
Strongly Agree	Count		16	0	16
	% within Lakegroup		57.10%	0.00%	33.30%
Agree	Count		9	4	13
	% within Lakegroup		32.10%	20.00%	27.10%
Neutral	Count		3	9	12
	% within Lakegroup		10.70%	45.00%	25.00%
Disagree	Count		0	6	6
	% within Lakegroup		0.00%	30.00%	12.50%
Strongly Disagree	Count		0	1	1
	% within Lakegroup		0.00%	5.00%	2.10%
Total	Count		28	20	48
	% within Lakegroup		100.00%	100.00%	100.00%

Chi-squared = 27.349, p = .00

and not interval variables. The stricter statistical approach applied here is to test for significant differences in Likert ratings between groups by applying chi-squared tests. But it is noteworthy that conclusions of significant differences are corroborated by results of t-tests shown in Appendix 2, Table A2.1. Just as t-tests have limitations when applied to Likert scales, so too these applications of chi-squared analysis are problematic given that many cells have expected cell frequency less than five. This can overstate the significance of chi-squared tests.

Descriptions of other goals that owners provided are reported in Appendix A3 as comments to Q5d – g. Percentages of agreement that these other goals are being met are shown in Appendix A1.

Owners were asked to describe specific ways water levels impacted opportunities for water-based recreation and use of shoreline infrastructure in Q6 and Q7, respectively. All comments are recorded in Appendix A3 and are highlighted below in the next sub-section. Comments were categorized by whether the conditions occurred in high or low water.

The listings were categorized at the end of question 7 as: only problems with low water, only with high water or with both. The percentages in each category are shown in Appendix A1. Of the 60 who listed problems, 25 cited problems with both, 21 only described problems with low water and 14 only with high water. The pattern of responses varied by lake group as shown by the crosstabs in Table 5 below. The chi-squared test was employed (with two nominal variables) and is significant at the 1% level. This result is driven by the fact that 20 of the 21 owners who only cited problems with low water have businesses on the Namakan Reservoir. This pattern is reversed for high water in that 12 of 14 who cited only problems with high water own businesses on Rainy Lake. Table 5 shows that of the 60 who cited problems with water levels, 35 were on Namakan Reservoir and 25 were on Rainy Lake. Being some did not respond to this question, it is worth noting the overall breakdown of ownership (Lake group) between the Namakan Reservoir (40) and Rainy Lake (27).

Table 5. Crosstabs on Water Level Problems by Lake Group

Low or High More Hazardous?		Lakegroup		Total
		Namakan Reservoir Lakes	Rainy Lake MN & ON	
Both Equally Hazardous	Count	13	12	25
	% within Lakegroup	37.10%	48.00%	41.70%
Low	Count	20	1	21
	% within Lakegroup	57.10%	4.00%	35.00%
High	Count	2	12	14
	% within Lakegroup	5.70%	48.00%	23.30%
Total	Count	35	25	60
	% within Lakegroup	100.00%	100.00%	100.00%

Chi-squared = 23.355, p = .00

Most respondents had only general recall of periods in the past when high or low water occurred. Fifty four respondents were able to recall periods of high water and 34 recalled periods of low water. These numbers are higher than the previous listing of "problems" because some did not see the high or low levels as problems when they occurred. Some referred to years with particularly memorable extremes but most struggled to recall specific years. The lists of periods outside the rule curves shown in Appendix E were available for reference but only a few respondents wanted to consult these lists. It was more common to refer to the illustrations of the two sets of rule curves (visual aid contained in Appendix D) as respondents tried to recall specific changes in the RC Max and Min by months. Most were able to list the season of the year when they recalled patterns of recurring high or low water. These seasons are listed in Table 6 below. Relative frequencies are reported regarding seasons when high or low conditions were observed. Nearly all of the low water events were listed as occurring in spring while the high also extended into early summer.

Table 6. Seasons When High or Low Water Was Observed

	high when?	low when?
	Valid Percent	Valid Percent
Spring	59.3	85.7
Early Summer	38.9	8.6
Late Summer/Fall	1.9	5.7
Total	100%	100%
	n = 54	n = 35

The main non-monetary measure of impacts of water levels on resorts is yielded in answers to question 9. It asked respondents to consider all the conditions described to that point in the interview and to rate the impacts of the 2000 rule curves from strongly favorable (1) to strongly unfavorable (5). As shown in Appendix A1, over 60% answered strongly favorable or favorable with another 23% split evenly between unfavorable and strongly unfavorable. So the typical response was supportive of the changes in the rule curves. However the pattern of responses across the two lake groups must be noted.

The breakdown of frequencies of responses on favorability of the rule curve changes between the two lake groups is shown below in Table 7. The chi-squared test is significant at the 1% level. The pattern is toward favorable ratings by owners on Namakan Reservoir lakes and unfavorable ratings by owners on Rainy Lake. All 14 of the ratings less favorable than neutral came from owners on Rainy Lake.

Table 7. Favorability Ratings of the Rule Curve Changes Cross-tabulated by Lake Group

	Favorability Rating		Lakegroup		
			Namakan Reservoir Lakes	Rainy Lake MN & ON	Total
	Strongly Favorable	Count	18	1	19
		% within Lakegroup	51.40%	3.80%	31.10%
	Favorable	Count	15	3	18
		% within Lakegroup	42.90%	11.50%	29.50%
	Neutral	Count	2	8	10
		% within Lakegroup	5.70%	30.80%	16.40%
	Unfavorable	Count	0	7	7
		% within Lakegroup	0.00%	26.90%	11.50%
	Strongly Unfavorable	Count	0	7	7
		% within Lakegroup	0.00%	26.90%	11.50%
Total		Count	35	26	61
		% within Lakegroup	100.00%	100.00%	100.00%

Chi-squared = 40.361, p = .00

While t-tests comparing mean Likert ratings are not appropriate if these are interpreted as ordinal measures, an independent samples t-test corroborates the chi-squared results showing differences in ratings among owners on the Namakan Reservoir versus those on Rainy Lake. Table A2.1 shows the t-test on favorability ratings is significant at the 1% level. The mean rating for Namakan Reservoir owners is 1.54 (in between favorable and strongly favorable) while the average for Rainy Lake respondents is 3.64 - on the unfavorable side of neutral.

Question 10 asked owners to report impacts in terms of annual changes in visitor days (occupancy of lodging units proved to be more straightforward) or percentages of sales. The group who reported having more visitor days (37.8%) was slightly larger than those reporting fewer visitor days (35.6%) with the remainder of the 45 respondents reporting no change (26.7%). Given the disruption due to high water in 2014 some preferred to report impacts in actual dollars terms. As the main focus of this study, the economic effects on resorts are discussed in depth in a separate sub-section below. The context for these economic changes is provided in Table 8 below which shows the sizes of these businesses in terms of typical annual sales (categorized in ranges in Q11).

The end of the interview protocol captured the location of the resorts and the gender of respondents. Just over three fourths of the businesses are located on the MN side of the study lakes. Nearly two thirds of respondents were male.

Table 8. Gross Annual Sales of Resorts

	Gross Sales
	Valid Percent
Less Than 250 ($000)	54.1
250 < 500	21.3
500 < 750	9.8
750 < $1 mill	3.3
$ 1 mill < $1.25 mill	3.3
$1.25 < $1.5 mill	1.6
$1.5 mill < $2 mill	3.3
$2 mill < $3 mill	3.3
Total of n = 61	100%

Open-Ended Comments to Explain Answers by Topic

Verbal comments made by resort owners during the interviews were recorded as close to verbatim as possible. Verbatim comments were provided by those who participated via US mail or e-mail. All comments throughout the owner interviews are listed in Appendix A3. Comments that represent common views among multiple respondents are highlighted in Appendix F, categorized by topic. The open-ended comments enrich the quantitative data and enhance understanding of respondents' views. Descriptions of conditions and explanations of answers add immensely to the information provided and affirm for respondents that their input is understood and valued. The verbal comments are particularly crucial for those who felt economic impacts but could not express them in dollar terms. Given the focus on economic impacts on resorts, the descriptions of economic impacts in the appendices are noteworthy and are used to complement the quantitative measures summarized elsewhere in this report. A good deal of evidence is provided that the burden placed on business owners by difficult water conditions does not necessarily result in lower revenues because owners make immense efforts to shield their customers from disruption and inconvenience. Still scarce resources are committed to helping customers cope which represents a true economic cost in time and effort that is not registered in changes in sales.

Another contribution of the open-ended comments is to provide specific details on what matters to business owners and their customers and particular conditions that impact suitability for water-based recreation. The closed-ended responses indicate patterns of favorable or unfavorable reactions to high and low water conditions. This provides useful evidence relevant to the objectives documented in the POS that conditions would improve in spring on the Namakan reservoir and that little change was anticipated for the tourism industry on Rainy Lake. But the concerns with high water outside the curves on Rainy indicate a more complicated situation and the open-ended comments round out this story. They also provide a more comprehensive perspective on another concern with rule curve changes pertaining to lower drawdown in late summer, particularly regarding navigability of the Loon River.

Results from the Customer Interviews
Statistics from Closed-Ended Responses

The success of resorts and resort-like businesses that are the focus of this study depends on the satisfaction of their customers. Much of the evidence provided in the owner interviews pertains to perceived conditions that are conducive to satisfactory water-based recreation. The customer interviews were conducted to investigate the degree of corroboration that exists between customer perspectives and the business owners that aim to serve them, particularly regarding water levels suitable for recreation.

Interviews were conducted with long-time customers, defined as those with experience under the old and new rule curves. As such this group of repeat customers is not likely to represent all customers over the decades in that these people have kept coming to these businesses. It was beyond the scope of this study to include customers who quit coming to these businesses as it would have been extremely difficult to track down those who quit visiting the area. The group of long-time customers interviewed does include people who were dissatisfied with past conditions so adjusted their behaviors, such as changing the weeks when they visit. So the information gathered from the customer interviews is valuable, but must be qualified in that it comes from a select segment that has been satisfied enough to keep coming over many years.

As owners were wrapping up their answers to the interview questions, they were asked to refer the interviewer to customers who had experience under the old and new rule curves. For convenience sake, we hoped that the recommended customers would be available to be interviewed while we were there. In many cases that was possible. But over half of the 53 customers interviewed were not available face-to-face while the interview team was at the business. In order to gather input from the customers that the owners recommended for inclusion in the study, telephone interviews were conducted with 13 respondents. Two responded through the US mail and 14 submitted responses via e-mail. In a few cases owners did not recall correctly how long certain customers had been coming, so those without experience under the old rule curves were not included. It is important to note that only 15 of the 53 customers who participated were at businesses on Rainy Lake (eight in ON and seven in MN) with the other 38 split among Kabetogama (33) and Crane Lake (5) businesses. The high water levels during the summer of 2014 presented the greatest challenges for recruiting customers to participate on Rainy Lake. Most of the ON participants were interviewed by mid-June before the water levels rose above the RC Max.

The customer group represents an impressive history of visiting the area. The median year for the initial trip to the area was 1980. Seven of the customers reported 50 or more years of coming to the area. The distribution of years for respondents' first visits is shown in Table B2.1 in Appendix B2.

The customer questions replicated those for owners up to the latter portion of the interview when owner versus customer information had to diverge, such as business revenue mirroring spending from the customer vantage point. The customer interview was longer so as to include specifics about recreational activity and satisfaction with the experience.

Customers were asked to assign importance to the same five features included in the owner interviews. Responses were similar to the owners in that a great deal of importance was assigned to all five. Means are as follows: water levels = 4.21, water quality = 4.4, walleye habitat = 4.44, northern pike habitat = 3.69 and wildlife habitat = 4.12. Again northern pike habitat was rated lower in importance and is the only rating across the two groups with an average below 4. Relative frequencies of customer responses on importance of the five features are shown within the interview questions in Appendix B1 and in Table 9 below.

Table 9. Customers' Importance Ratings for All Five Conditions

	Water Levels	Water Quality	Walleye Habitat	Northern Pike Habitat	Wildlife Habitat
Not Important At All	0	0	0	3.8	1.9
Not Very Important	3.8	3.8	0	5.8	3.8
Somewhat Important	7.7	0	9.6	32.7	11.5
Very Important	51.9	48.1	36.5	32.7	46.2
Extremely Important	36.5	48.1	53.8	25	36.5
Total	100%	100%	100%	100%	100%
Valid Percent of n = 52					

All three agreement levels were rated as above neutral (3) meaning the typical customer slightly agreed that the goals had been met. The means are: water levels = 3.72, water quality = 3.58, and fishing quality = 3.71. Again these means are quite similar to those for the owners. Percentages for the degree of agreement are shown with the questions in Appendix B1 and in Table 10 below.

Table 10. Customers' Levels of Agreement: Goals of Rule Curve Changes Have Been Met

Agreement Rating	Water Levels	Water Quality	Quality of Fishing
	Valid Percent	Valid Percent	Valid Percent
Strongly Agree	28.3	13.5	28.8
Agree	37.7	38.5	26.9
Neutral	18.9	42.3	30.8
Disagree	7.5	3.8	13.5
Strongly Disagree	7.5	1.9	0
Total	100%	100%	100%
	n = 53	n = 52	n = 52

Table B2.2 in Appendix B2 shows agreement with other goals listed by 20 of the customers who responded to questions Q3d – f. The descriptions of other rule curve goals are shown in Appendix B3 along with all customer comments. Given the similarity of means, the Importance-Agreement grid is not repeated here as it would look nearly identical to the one shown for owners. The results show that important features were included in the interview protocol and the typical customer agrees that the goals for improvement in the rule curves are being met. One noteworthy difference is that customers, on average, were less polarized than owners as to whether water level goals had been met. This difference must be interpreted with caution given the overrepresentation of Kabetogama customers in the sample as is discussed further in the Discussion and Implications section below.

The explanations of these ratings and the descriptions of problems with high and low water enhance understanding of these perspectives. Comments are provided in Appendix B3. These comments contain a wealth of information on how customers view water levels in relation to their activities. Very few customers could list specific years (other than 2014) when they encountered high or low water. They recalled high or low levels and may have encountered difficulties, but pinning down the years was not possible for most customers. Again the list of

periods with water levels outside the curves was only referred to in a handful of interviews, with a larger number consulting the illustration of the rule curves contained in Appendix D. Over half of the customers reported that problems were worse with low water. The sensitivity of customers to low or high water differed between lakes. While expected cell frequencies are problematic for conducting a valid chi-squared test (below five in 33% of the cells), Table 11 indicates a pattern that is significant at the 1% level. There is a strong pattern in that six of the seven customers who said that problems with high water are worse use Rainy most while 27 of the 28 who view low water as worse primarily use Kabetogama or other Namakan Reservoir lakes.

Table 11. Water Level Problems for Customers Cross-tabulated by Lake Group

Low or High More Hazardous?		Lake Used Most Grouped		Total
		Namakan Reservoir Lakes	Rainy Lake MN & ON	
Both Equally Hazardous	Count	6	5	11
	% within Lakegroup	17.60%	41.70%	23.90%
Low	Count	27	1	28
	% within Lakegroup	79.40%	8.30%	60.90%
High	Count	1	6	7
	% within Lakegroup	2.90%	50.00%	15.20%
Total	Count	34	12	46
	% within Lakegroup	100.00%	100.00%	100.00%

Chi- squared = 22.409, p = .00

Customers responded that most low water problems occurred in springs of the past and most high water has tended to occur in early summer, including multiple times since 2000. Table 12 shows these percentages by season.

Table 12. Seasons When Customers Observed High or Low Water

	high when?	low when?
	Valid Percent	Valid Percent
Spring	8	93.1
Early Summer	92	3.4
Late Summer/Fall	0	3.4
Total	100%	100%
	n = 25	n = 29

Again a main measure of impacts of water levels on the customer experience is yielded in answers about the degree of favorability of the rule curve changes overall (Q7 in the customer interview). It asked respondents to consider all the conditions described to that point in the interview and to rate the impacts of the 2000 rule curves from strongly favorable (1) to strongly unfavorable (5). As shown in Appendix B1 and Table 13 below, 76% answered strongly favorable or favorable with another 13% being neutral. So the typical customer was very supportive of the changes in the rule curves. Again this finding must be qualified because the small percentages that were unfavorable (disproportionately on Rainy) may be a result of the

inability to recruit participants that stayed away due to high water. The chi-squared test is significant at the 5% level but 60% of the cells have too low of expected cell frequency.

Table 13. Customers' Favorability Ratings of Rule Curve Changes Cross-tabulated by Lake Used Most

Favor?		Lake Used Most		Total
		Rainy	Namakan Reservoir Lakes	
Strongly Favorable	Count	4	13	17
	% within Lake Used Most Grouped	28.60%	40.60%	37.00%
Favorable	Count	4	14	18
	% within Lake Used Most Grouped	28.60%	43.80%	39.10%
Neutral	Count	3	3	6
	% within Lake Used Most Grouped	21.40%	9.40%	13.00%
Unfavorable	Count	0	2	2
	% within Lake Used Most Grouped	0.00%	6.30%	4.30%
Strongly Unfavorable	Count	3	0	3
	% within Lake Used Most Grouped	21.40%	0.00%	6.50%
Total	Count	14	32	46
	% within Lake Used Most Grouped	100.00%	100.00%	100.00%

Chi-squared = 9.773, p = .04

The customer and owner interview protocols diverge at this point to gather different information pertaining to customers versus "sellers." Customer questions delve into their activities and characteristics of their trips. Spending information and changes in visitor days due to water levels are key aspects of the economic impacts from the demand side, so are reported below in the sub-section on economic impacts.

An elaborate series of questions was utilized to track recreational activity of customers across the study lakes. The matrix shown in Appendix B1 (accompanied by the visual aid shown in Appendix C) facilitated a smooth and efficient process for customers to provide this information. To simplify data (totals would greatly exceed 100% because most customers engage in multiple activities on multiple lakes) and to avoid the clutter of % signs, the numbers shown in the matrix in Appendix B1 are the raw scores of responses out of 53 customers. This captures the patterns of lake use among the respondents and the popularity of recreational activities. Table B2.3 in Appendix B2 lists other activities mentioned by respondents.

The lake used most often - by half of the respondents - is Kabetogama. As shown in Table 14 below, nearly a third used Rainy Lake most often. Comparing these results to the lakes where resorts are located indicates that some customers travel to a different lake than the one where they are staying. For example, some customers on Crane Lake use Namakan and Kabetogama heavily.

Fishing is by far the dominant activity. Table 15 shows that 83% report fishing as the type of recreation done most often on these lakes and among the others listed, fishing is equally important in combination with other activities such as pleasure boating.

The answers to Q9 about days spent in the area per year indicate that long-time customers tend to stay longer than the typical visitor who tries an area for a long weekend or a week. The length of stay numbers are influenced in part by the screening for repeat visitors and the

Table 14. Lake Used Most Often

Lake		
	Frequency	Valid Percent
Rainy	16	30.2
Namakan	4	7.5
Kabetogama	29	54.7
Sand Point	2	3.8
Crane	1	1.9
Combination	1	1.9
Total	53	100%

Table 15. Recreational Activity Done Most Often

Activity		
	Frequency	Valid Percent
Fish	44	83
Pleasure Boat	1	1.9
fish, boat and swim	1	1.9
fish, boat and ski, tube	1	1.9
commercial travel	1	1.9
all except sailing	1	1.9
fish and boat	1	1.9
fish and canoe	1	1.9
boat and swim	1	1.9
Combination	1	1.9
Total	53	100%

convenience of finding customers in camp at the time of interviews. Days the customer spends in the area per year are shown in Figure 4. Long-time customers are more likely to be retired so can afford more days at the lake. And the life-cycle of lake visitors often leads to repeat visitors renting a cabin or mobile home for a month or more. That pattern is highly represented among the customers in the interviews. While about 20% reported stays less than a week and a half, another 30% spent 2 -3 weeks a year visiting the area and nearly 40% spend a month or more. Those who stay that long were convenient referrals for interviews with a common recommendation being on the order of "Go to unit x because Joe's been coming forever and is usually around his rental trailer."

The percentages for satisfaction with the overall recreational experience (Q11), water quality in relation to recreational use (Q12) and with the quality of fishing (Q13) shows a high level of satisfaction with all three elements. Percentages by satisfaction level are shown for each of the three questions in Appendix B1 and combined in Table 16. Again high levels of satisfaction would be expected among long-time repeat visitors. Still these high levels of

Figure 4. Days Customer Spends in Area Per Year
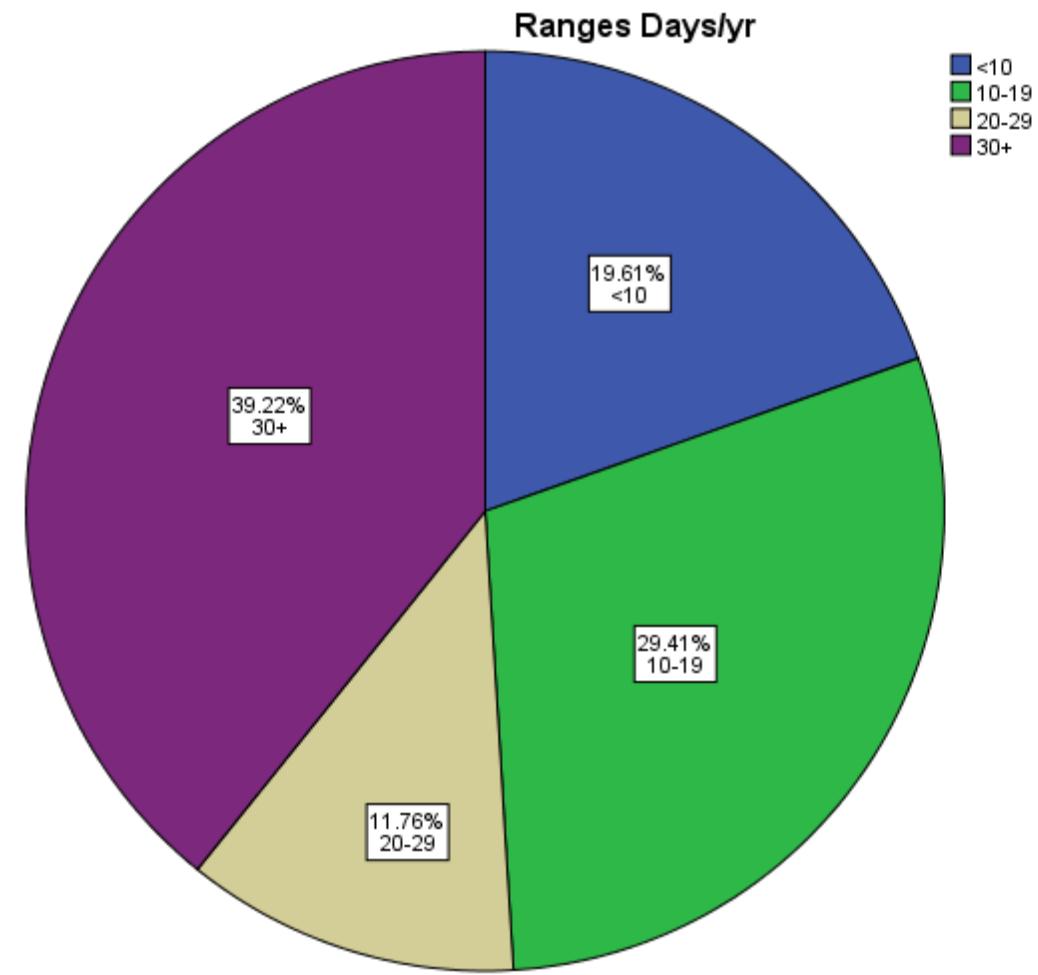
Table 16. Levels of Satisfaction With Three Aspects

Satisfaction Level	Quality of Experience	Water Quality	Fishing
	Valid Percent	Valid Percent	Valid Percent
Extremely Dissatisfied	2	0	0
Somewhat Dissatisfied	3.9	3.9	3.8
Neither	0	0	5.8
Somewhat Satisfied	15.7	45.1	46.2
Extremely Satisfied	78.4	51	44.2
Total	100%	100%	100%
	n = 51	n = 51	n = 52

satisfaction are encouraging in terms of management of the aquatic resources, including water levels. For those with ideas for improving the fishing, relative frequencies of closed-ended response options are shown in Appendix B1 and open-ended descriptions are provided in Appendix B3. Many ideas were shared about fishing pressure, slot sizes and habitat.

Nearly two-thirds of respondents were MN residents.   Only a couple were residents of ON and the rest were mostly from other Midwestern states, listed in Table B2.4. The age distribution of respondents by decades is shown in Figure 5. Again there are some real "old-timers" who have patronized these businesses for a very long time, with 3.9% being born in 1930 or earlier. The median age of respondents is 60.

Figure 5. Year Respondent Born by Decade

Year Born by Decade

Legend:
- 1930 or earlier
- 1930s
- 1940s
- 1950s
- 1960s
- 1970s

5.88% 1970s
5.88% 1930s
15.69% 1960s
25.49% 1940s
43.14% 1950s
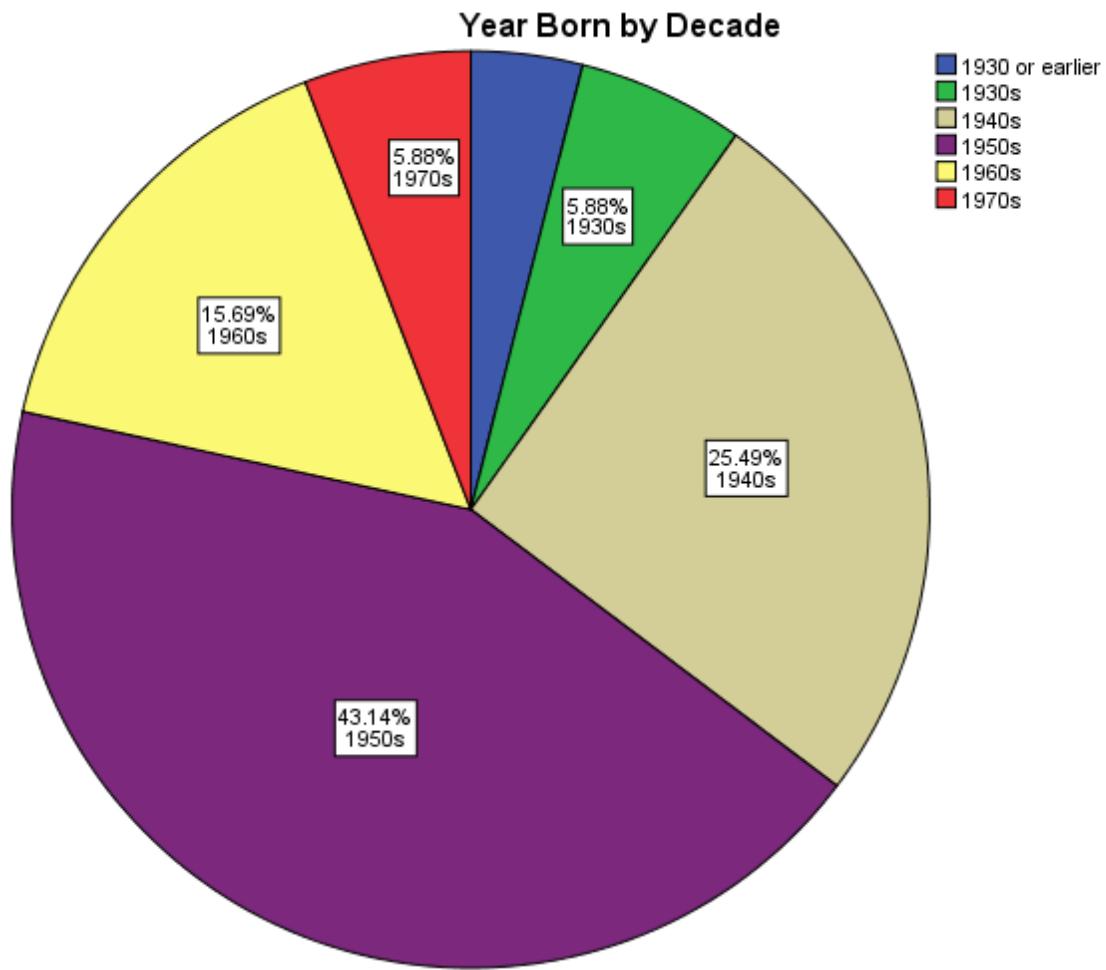
Most of the customers referred to the interview team by business owners were males so, in light of this, the interviewers looked to include women as much as possible. There were a large number of groups especially in early June that were entirely comprised of male anglers. But over the course of the season the demographics diversify with more family groups coming to the area. About a third of the groups interviewed included children. The breakdown of party size and inclusion of children is shown in Tables B2.5 and 6 in Appendix B2. Median party size is five and the mean is six. Most respondents were willing to check the category for their household income with nearly a third in the $100,000 or higher range: see frequencies for Q20 in the interview protocol in Appendix B1.

Open-Ended Comments to Explain Customer Answers

As was the case in owner interviews, verbal comments made by customers were recorded as close to verbatim as possible. Customers who participated via US mail or e-mail have their comments recorded verbatim in Appendix B3. Comments that represent common views among multiple respondents are highlighted in Appendix F where representative comments are categorized by topic.

As noted above, comments provided further explanation for the answers to questions with limited response options. Comments are also rich in describing the types of problems lake users have with water levels. But people did not only share negative aspects as so many of these visitors were enjoying an area that they love and were happy to share their joy in the interview. Hence many of the comments recorded in Appendix B3 capture what motivates people to keep coming to the area. Some expressed an appreciation for the thorough and careful questions which allowed them to provide input on a matter that is important to them. The fact that many did not express deep concerns with water levels speaks in part to the efforts of resort owners to buffer customers as much as possible from difficult conditions on the water.

Economic Impacts on Resorts
Evidence from Owner Interviews

Of the population of 67 owners of resorts, houseboat companies, outfitters and marinas, 59 included comments pertaining to economic impacts of water levels. All owner comments are shown in Appendix A3. Question 10 asked specifically about impacts on visitor days, sales or both so the responses listed for Q10 contain the bulk of the information on resort business activity, but some of the other questions also elicited responses pertaining to water level impacts on visitor days, occupancy and sales. The interview protocol asked owners to describe economic effects of the rule curves in the typical year since 2000. When attaching dollar values was possible this was done in current (2014) dollars. Being much of the business at Ontario resorts is done in US currency the interview protocol specifies estimates in US dollars. Respondents were also directed to distinguish between impacts that occurred due to the differences in the rule curves and those that would have occurred regardless of the rule curves, such as fluctuations due to weather. The views of owners in categorizing impacts in this way can be gleaned from the comments in Appendix A3. The 59 who responded on economic effects of water levels are summarized in Table 17.

Table 17. Summary of Responses on Economic Effects

FORM OF RESPONSE	POSITIVE EFFECTS: # of RESPONDENTS ($ Values)	NEGATIVE EFFECTS: # of RESPONDENTS ($ Values)	TOTAL PRE-2014	LOSSES IN 2014: # of RESPONDENTS ($ Values)
Non-Quantitative	14	2	16	7
Estimate of $ values	6 ($444,000)	4 ($97,000)	10	15 ($707,000)
TOTAL	20	6	26*	22

    * [40 Combined with 7 (no change) and 7 (not sure)]

Twenty owners described positive impacts on their businesses due to the 2000 rule curves: six gave quantitative responses and the other 14 provided verbal descriptions of the improvements since 2000. Six owners described negative impacts since 2000 (but prior to the high water of 2014): four providing quantitative information and two verbal descriptions. Seven owners answered that there were no changes or business was about the same due to the rule curves and another seven said they were not sure if the rule curves had an impact or could not measure it. That makes a total of 40 owners who commented specifically on their business activity relative to the rule curves: 26 assigned positive and/or negative directions to the impacts.

In addition to the 14 who verbally described positive impacts of the 2000 rule curves on their businesses, six quantified impacts as follows: 1) saving $3,000 each spring by not having to offer discounts to attract customers as was necessary due to the low water allowed under the old rule curves, 2) twenty weeks of lodging are added due to sufficient water in spring under the 2000 rule curves (estimated $26,000 in additional lodging revenue each spring, and - as a full service resort capturing a great deal of spending on boat and motor rentals, restaurant and bar sales and miscellaneous purchases - total sales at the resort of $80,000), 3) one third of occupancy for a month or 12 weeks of lodging allowing $12,000 more in lodging sales and $36,000 in direct spending, 4) one fourth of sales for year or $50,000 in direct spending at the resort are added due to better water levels, 5) $25,000 more in sales at the resort, spring adds 6% to $400,000+ business (also saving $20,000 in advertising that was needed to attract spring customers pre-2000) and 6) $250,000 more in annual sales for a large houseboat company due to ample water in spring since 2000. Therefore the six businesses report a total of $444,000 in additional spending ($3,000 + $80,000 + $36,000 + $50,000 + $25,000 + $250,000).

Given the POS and SOW prescribe that the research focus on economic effects of the 2000 rule curves on resorts, understanding the information summarized in Table 17 is critical. The Methods section emphasizes that various measures (monetary and non-monetary) were employed to capture these effects. The virtue of this flexible methodology is demonstrated by the fact that most of the owners who reported economic effects before 2014 could not attach dollar estimates. So the dollar figures shown in Table 17 must be interpreted with the caveat that it only includes effects on the minority of resorts that could track business trends monetarily. The dollar estimates would be substantially higher if all of the impacted resorts could provide data in monetary terms. Qualifying these estimates in this way also points to the advantage of having verbal descriptions of these impacts (Appendix A3) and alternative measures provided by the Importance-Agreement scales and answers to Question 9 rating the favorability of overall impacts of the 2000 rule curves. From the author's perspective, informed by conducting the vast majority of interviews with resort owners, considering all of the measures of effects on resorts, these favorability ratings might be the single-most useful indicator to the IJC.

The Methods section also notes that, given the common practice of translating measures of tourism sales into regional economic impact, factors converting resort spending to total spending and regional economic impact multipliers are applied. The SOW places low priority on these extrapolations to the regional economy so as to maintain primary focus on the immediate effects on resorts. The SOW specifies that regional approximations should be based on advice from tourism researchers to apply findings in the literature on conversion factors and multipliers that are most generalizable to the study area. It is recognized that some primary data and modelling matching the narrow geographic boundaries of the study area are not available. Consultation with experts with Explore MN and the Ontario Ministry of Tourism, Culture and

Sport led to application of findings from two MN tourism studies and Ontario's Tourism Regional Economic Impact Model (TREIM).

None of the Explore MN studies cited in the References is narrowly focused on the study area. The study titled "The Economic Impact of Expenditures By Travelers On Minnesota" looks at NE MN which includes Carlton, Cook, Itasca, Kanabec, Koochiching, Lake, Pine, and St Louis Counties. If data were available, the study area would ideally be defined as 25 miles from the shores of the six lakes impacted by the rule curves. This is a remote, rural area which encompasses the northern portions of Koochiching and St. Louis Counties including the small towns of International Falls, Ray, Kabetogama, Crane Lake and Orr. The NE MN region as defined by Explore MN includes larger towns and most notably Duluth. Less remote and more economically diverse areas with larger towns and cities tend to convert a greater portion of resort sales into total inter-industry spending and have larger economic multipliers because there is less leakage from importing inputs and outputs from outside the region than occurs in remote, rural areas such as the study area.

Additionally, NE MN boasts a wider distribution of lodging businesses than occur in the study area. Hotels, motels and B&Bs tend to have much higher ratios than resorts or campgrounds. The Explore MN study presents a conversion factor from lodging expenditures to total spending of 6.4. (Explore MN, page 40). The closest match in terms of types of lodging establishments is found in "The Economic Impact of Expenditures By Travelers On Minnesota's Northeast Region and The Profile of Travelers, (Explore Minnesota, 2012). Page 46 lists a separate estimate for resorts which yields a conversion factor of 3.7.

The Ontario TREIM model allows simulation of economic impacts but the smallest geographical region containing the study area is Region 13c, which comprises a large portion of NW Ontario. It contains population centers much larger than Fort Frances which is the only town on the Ontario side of the study area. Consequently TREIM also overstates these economic impacts. Simulated results from the model show that a dollar of direct resort spending converts to $2.13 of total direct spending. Additionally, the model yields a regional economic impact multiplier of 1.73. Given the mismatch of the modelled region to the study area these factors are also likely to exaggerate the economic impacts.

Approximating regional economic impacts for the purposes of this study is problematic for multiple reasons, not least of which is the limitation of available data from resorts. Recall from Table 17 that most resorts could not express the economic effects they experienced in dollar terms. So regional economic impact estimates are founded on a shaky cornerstone of incomplete values for changes in spending at resorts. A plausible case can be made from the literature that economic multipliers for a remote, rural area such as this could be close to one. This could serve as a lower-bound estimate of impacts meaning the regional change in economic activity (assuming resorts capture all of the spending in the area by their guests) is the same as the dollar values listed in Table 17.

For illustrative purposes crude estimates related to the results from Explore MN and TREIM are provided. Being simulations with TREIM provide specific numbers, direct resort spending is multiplied by 2.13 to estimate total direct spending and a regional economic impact multiplier of 1.73 is applied. These factors are likely to generate upper-bound estimates of impacts in a region as large as NE MN and NW Ontario and almost certainly overstate the impacts that would emanate from the dollar values in Table 17. But a countervailing caution is that the dollar amounts in Table 17 understate the change in total spending at resorts because most respondents could not quantify changes in sales.

Therefore the $444,000 in additional spending reported by the six businesses above would result in an estimated annual increase in total spending of $946,000 due to the improvements in the 2000 rule curves. Applying an economic impact multiplier of 1.73 yields an estimated economic impact of over $1.6 million each spring due to more suitable water levels.

These positive economic impacts on resorts and resort-like businesses occur because the new rule curves no longer allow the low water levels that occurred pre-2000. The negative impacts reported since 2000 occur from water levels above the 2000 RC max. In that sense the economic losses owners report are due to failure to keep water levels within the 2000 RC, not a result of the rule curves themselves. Responses imply that these losses would not have occurred since 2000 if water levels had stayed within the ranges prescribed in the rules curves. As such these economic impacts on resorts need to be viewed differently as they are not technically due to the rule curves, but high water levels above the 2000 RC max.

The six responses describing losses from high water on Rainy Lake from 2001 - 2013 include four that enable economic estimates. One was a MN resort and the other three were in Ontario. 1) Six weeks of lost occupancy in high water years (three cabins for two weeks) sacrificing $6,000 in lodging sales and $18,000 of resort business, 2) $10,000 in lost lodging sales from duck hunting and $30,000 less in direct spending at the resort, 3) 20% loss in sales amounting to $40,000 less resort revenue when water is high and 4) a 3% loss in lodging during high water of 2002 yielding $9,000 less in sales at the resort for a total loss of $97,000 as shown in Table 17. The instructions asked for impacts to be expressed in 2014 US dollars for the typical year that effects occurred. For the latter three in Ontario, $79,000 less in resort sales means $168,000 less direct spending in the area. Using an economic impact multiplier of 1.73 leads to an estimated $291,000 less economic activity in Ontario in years before 2014 when water was high. The $18,000 decreases in resort spending in MN implies $38,000 less direct spending with $66,000 in negative economic impact.

These losses were for resorts that lost sales due to high water <u>before 2014</u>. Many more - 22 - reported losses in 2014. That is, 22 respondents described business impacts of the high water of 2014 and all were negative. Responses regarding 2014 impacts are shown among all comments in Appendix A3. Fifteen quantified impacts on visitor days, occupancy and/or sales. Another seven of the 22 gave verbal descriptions of negative business impacts in 2014. Three of these 22 were also among the 40 who described either positive or negative impacts of the rule curves from 2001 – 2013: these three multiple responses rectify that the total of 62 responses shown in Table 17 comes from 59 respondents.

The 15 quantitative responses on losses in 2014 include seven resorts that reported a total of 34 weeks of lost occupancy amounting to $102,000 less in direct sales. The other eight who answered in terms of lost sales reported a total of $605,000 less in direct sales in 2014. That totals to $707,000 less in direct sales at resorts. Given the ratios from TREIM applied above, that implies $1.5 million less in sales due to lost tourism in 2014 and a negative economic impact of $2.6 million.

Four respondents also provided information on damages to materials and infrastructure such as docks and harbors, three of whom stated that the infrastructure damage translated into lost sales as well. The infrastructure damages are being tabulated in the separate study directed by Mike Shantz and must be understood as incomplete here being many owners said they'd report damages to him after all costs were finalized. The four that were reported in our interviews can be seen in Appendix A3. They amounted to $50,000; $178,000; $100,000 and $4,000 for a total of $332,000. These figures on damages to infrastructure are kept separate from

the estimated losses in sales above to avoid double counting. Furthermore, being these are costs to these businesses, the types of conversion factors and multipliers used to go from lodging sales to total expenditures and area economic impacts would not be appropriate to apply here. However it is noteworthy that while the expenditures to repair damaged infrastructure are a burden on resorts, there are other businesses (eg. dock building and repair) in the area that receive these expenditures as revenues and stimulate the economy in a different manner than tourism sales. To re-iterate, impacts on infrastructure are left out of the tourism estimates unless they impacted tourism sales, and all but one example of this occurred in 2014 so are placed in a separate category as unrelated to the differences in the rule curves.

Many of these resorts capture a large amount of non-lodging sales to seasonal cabin owners, for items such as boat gas, repairs, bait, etc. But a substantial amount of typical activity generated by seasonal cabin owners occurs at non-resort businesses, such as grocery stores, bait and tackle shops, restaurants, gas stations, etc. Less time spent at seasonal cabins due to difficult water conditions implies a much larger loss of economic impact than just the amount that emanates from losses to resorts, especially considering that seasonal cabin owners already have accommodations. The POS and SOW prescribe that this study focuses on economic effects on resorts and captures changes in activities by seasonal cabin owners only to the extent that resort owners reported these impacts on their businesses. But it is extremely important to recognize that much more of the economic impact of spending by seasonal cabin owners occurs outside the resort industry. The dependence of all businesses (resorts and others) on this group of customers is much higher in the Rainy Lake area due to the large number of seasonal cabin owners there. And these people used Rainy Lake much less in 2014 compared to a typical year. The Namakan Reservoir businesses depend much less on local cabin owners and much more on other visitors, especially those who spend part of their time in Voyageurs National Park.

Evidence from Customer Interviews

The most emphasis should be placed on the owners' responses on the impacts of the rule curves on their businesses, but the flip side of changes in their sales is changes in customer spending. Changes in occupancy and visitor days result from the actions of their customers. While the customer interviews were conducted with only a sample of long-time visitors, their responses on spending and changes in days visited due to the rule curves are extremely informative. The frequencies of customer responses to Q10 on spending per person per day are shown in Appendix B1. Table 18 converts these categories to the respective medians of the dollar ranges. This allows a crude approximation of the average spending per person per day of the groups included in the interviews. This calculation yields mean spending per person per day of $109. It is reassuring that this average falls within the range of estimates in northern MN varying from $105 to $115 (Explore MN, 2012).

Given the large median and mean party size and the length of stay highlighted earlier, these groups are spending considerable amounts in the area. As respondents talked through their expenditures in answering Q10, it was obvious that much of it was paid directly to resorts. Still a considerable portion was spread around the area. These customer activities are the foundation of the economic impacts estimated in the sub-section above. These customers described expenditures for lodging, gas, food and beverage, etc. at the resort which form the direct sales resorts reported. Total spending by customers in the area benefitted businesses beyond the resorts, and the revenue to businesses spins off as these wages and profits reverberate through the local economy as a multiplier effect to generate broader economic impact.

Table 18. Daily Spending Per Person (Median of Range)

median for range		
	Frequency	Valid Percent
25	8	16
75	22	44
125	11	22
175	4	8
275	2	4
325	3	6
Total	50	100%

To maintain focus on the rule curves, customers were asked in Q14a whether the 2000 rule curves had resulted in their changing the number of days they visit the area. Percentage breakdowns for Q14a are contained in Appendix B1. Roughly three fourths of respondents said they were visiting the same amount of days. But of the remaining fourth, all but one said they were coming more days because of the 2000 rule curves. The one person who visited less only did so in 2014 so not for a typical year since 2000. Those coming more did so in the typical year. In order to quantify the addition or reduction in the number of days visited, Q14b asked about the change in the number of days. These results are categorized in Table 19. The one who reported coming less reduced the stay on Rainy Lake by three weeks due to high water in 2014, out of a typical stay in the area of about 3 months. Some who reported coming more days attributed this to the rule curves in combination with other factors such as more income or time due to retirement. While the vast majority did not report changing the number of days, the results point to improved economic impacts on resorts from the 2000 rule curves.

Table 19. Change in Number of Days Visited Due to the Rule Curves

Change in Days Visited		
	Frequency	Valid Percent
-21	1	2.2
0	36	78.3
3	1	2.2
4	1	2.2
14	3	6.5
15	1	2.2
20	1	2.2
40	1	2.2
50	1	2.2
Total	46	100

Evidence on Tourism Trends from Available Data from Government Sources
       Data on the Explore MN website provided in collaboration with the MN Department of Revenue is available since 2000 for a group of counties (NE region). It provides useful background for tourism trends in the study area unrelated to the rule curves. The counties forming the northeast region are: Carlton, Cook, Itasca, Kanabec, Koochiching, Lake, Pine, and St. Louis. Changes in tourism spending at resorts in the study area reported in the interviews can be placed in context relative to changes that occurred in this broader region of counties. It is assumed that forces that caused ups and downs in tourism spending in this broader region also affected spending within the study area. Differences in fluctuations between resorts in the study area and the broader region might be attributable to factors unique to the study area, including water levels affected by the rule curves.

       In Ontario, the available data from the Ontario Ministry of Tourism, Culture and Sport is less suitable for detecting trends comparable to the study area. The smallest geographical area in the data is Region 13c of northwest Ontario, a very large region, and these 13 regions were only formed in 2009. While data is retrievable back to 2006, the data from 2006 - 2010 is in Total Visits, not spending. Furthermore, a new methodology was utilized in 2011, the most recent year available, and while spending is reported for the 13c region, it is not comparable to previous years. So rather than use limited data for Region 13c, the trend in tourism spending for all of Ontario from 2000 – 2010 is tracked below in Figure 6. Tourism Receipts in Ontario show a drop in 2003 followed by an upward trend without an evident decrease around the recession in 2007 – 2009, with a slight overall downward trend since 2000 when adjusted for inflation.

Figure 6. Ontario Tourism Receipts
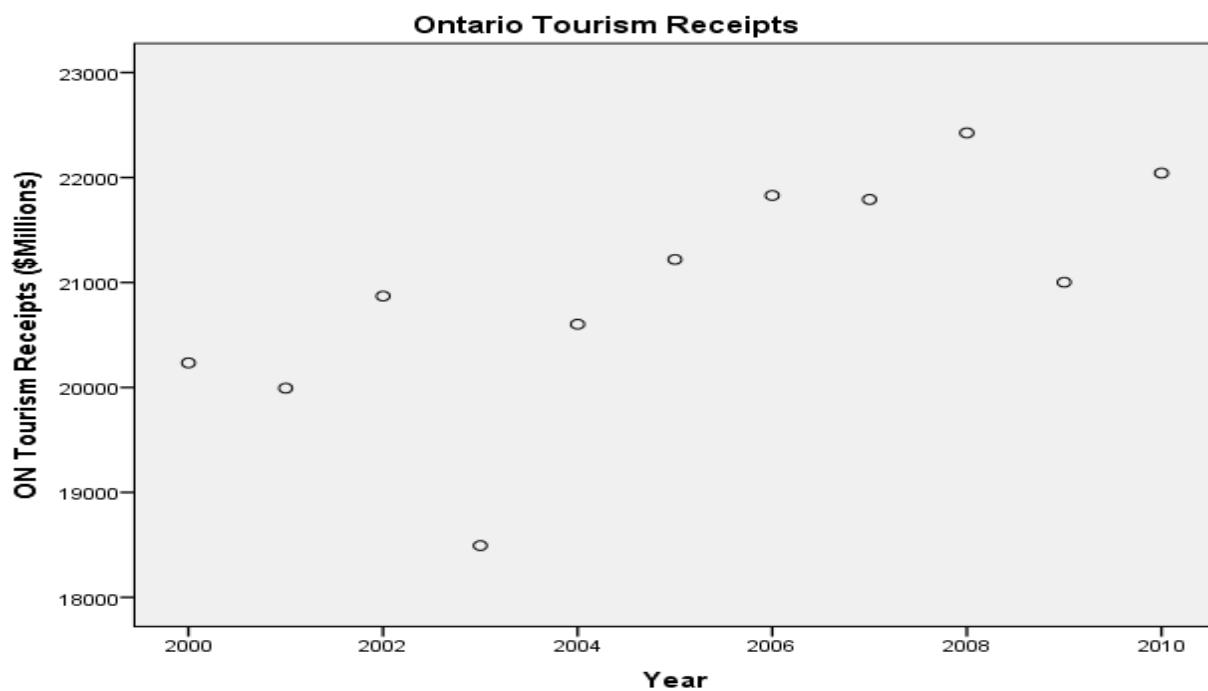
       Initial discussions with collaborators on the purpose of this analysis point to the usefulness of tracking trends in MN further back (perhaps 25 years) to see if the market share of tourism sales in the study area has changed relative to sales in the NE region. Data is available over this time span and can be narrowed down to resorts around International Falls and in St.

Louis County (excluding Duluth and the other cities that are reported separately). So the hypothesis would be that resorts in the study area have improved their market share in the region since the 2000 rule curves were implemented because water levels have been more suitable for tourism than under the old rule curves. That is, assuming resorts in the study area were experiencing the same overall influences as others in NE MN before and after the 2000 rule curves were implemented, and assuming the 2000 rule curves have improved the suitability of water for tourism, the resorts in the study area should have been underperforming before 2000 and should have improved performance relative to the broader region since.

Unfortunately the data in the counties is not refined enough to detect these changes empirically. For example, there is too large of a subset of lodging expenditures in St. Louis County that is outside of Duluth and other cities listed but not in the subset of businesses in the study area either. So the geographical breakdown is too poor of a match to test the hypothesis. Furthermore consistent measures for tracking sales were initiated only since 2004.

During interviews it was revealed that lodging tax data is available for the main clusters of resorts in MN, but not for ON. This data was suggested as an alternative test, especially by a few resorts that were frustrated that they did not have records going back to show how spring tourism has improved since 2000. So this data is used below in conjunction with data from the resort interviews to investigate aggregate trends in spring lodging sales.

Discussions with collaborators on the study cautioned that the hypothesis may not be testable given the complex set of changes that have influenced tourism on both sides of the border in the last decade or so. For example, representatives of Ontario tourism organizations cite changes in customs rules since 9/11 that have decreased visits to the Ontario side of these border lakes because more travelers are being denied entry to Ontario. Not only have they not been visiting Ontario but it is argued that they may instead be vacationing on the MN side of these border lakes. These trends will be explored further for MN with the lodging tax data below. The resort owner interviews in Ontario did express concerns that multiple negative influences of government policy are burdening their businesses and Ontario tourism in general. The graph from the Ontario Ministry of Tourism, Culture and Sport (Figure 7) indicates a drop in border crossings across the province of roughly 40% but a less dramatic decrease in crossings at the customs stations near the study area.

Figure 7. US Border Crossings: Source: Statistics Canada, Ontario Ministry of Tourism, Culture and Sport

38
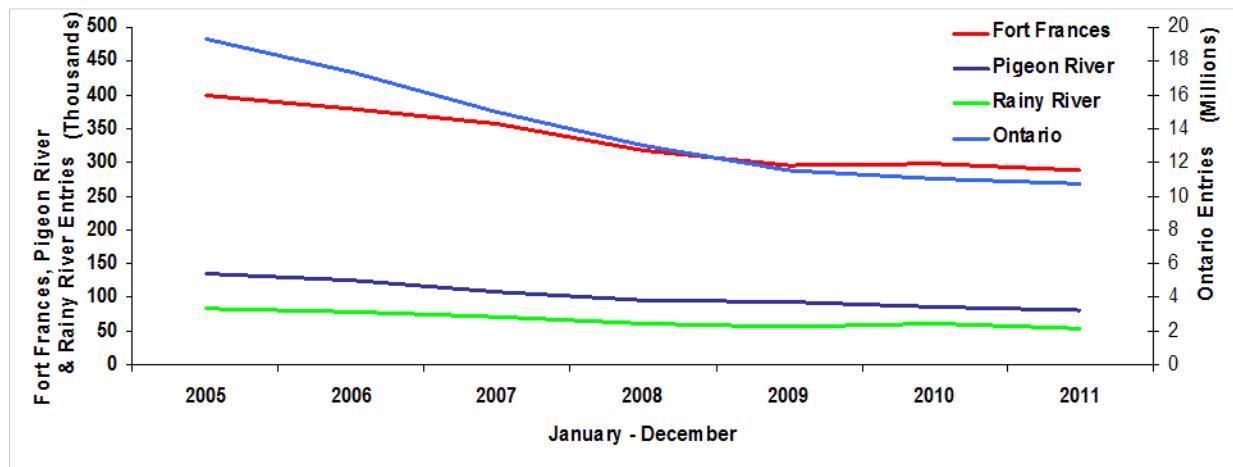
Gross sales at Resorts in NE MN from 2004 – 2011 are shown (Figure 8) to vary between just over $74 million to peaks nearing $81 million. Overall there is a slight upward trend with ups and downs around the recession years of 2007 – 2009. When adjusted for inflation the trend is for a slight decrease in real tourism spending in the region.

Figure 8. Gross Sales at Resorts in NE MN
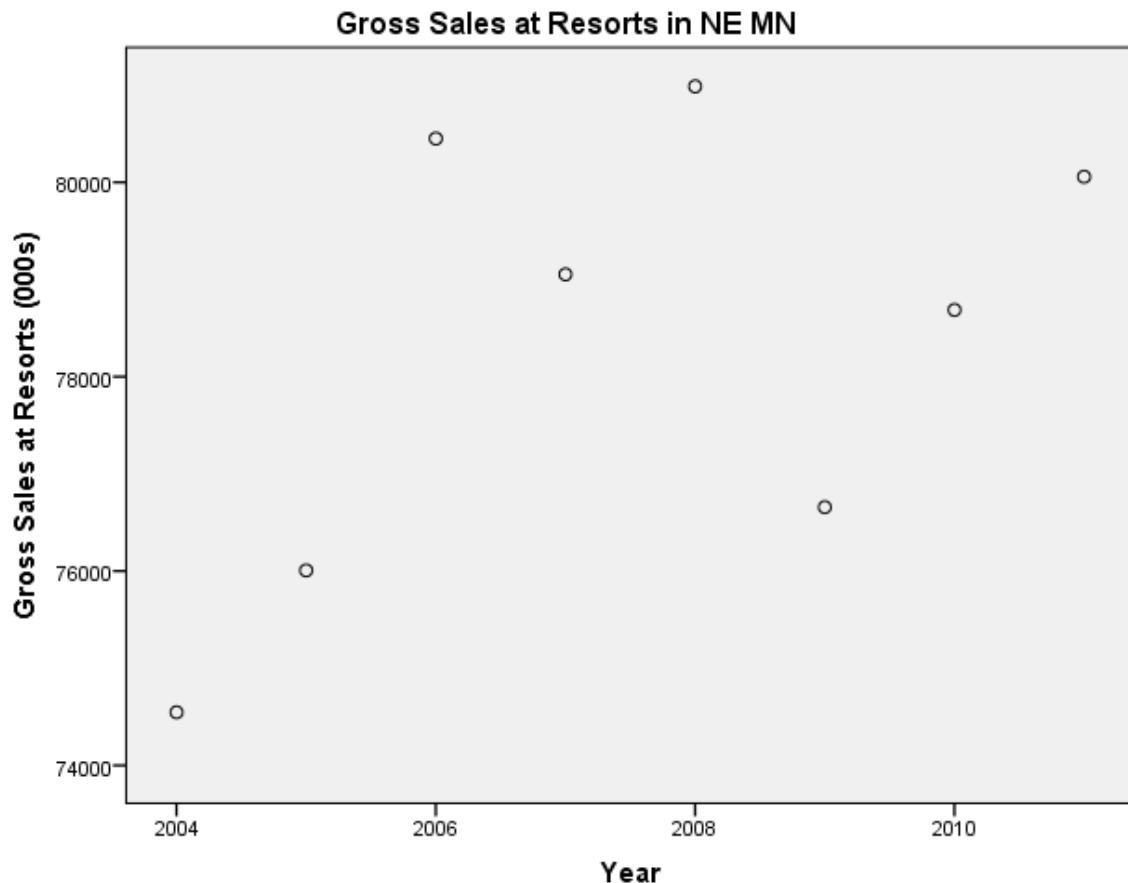
Evidence from Local Lodging Tax Data

Numerous resort owners suggested looking at lodging tax receipts as possible evidence on how the local tourism industry has changed due to the 2000 rule curves. Most owners did not have individual business records to share going back fifteen+ years to track trends in sales. The three lodging tax jurisdictions in the study area - Crane Lake, Kabetogama and Koochiching County - all have data on lodging tax receipts going back to the 1990s. They started at different times and have kept records in slightly different forms, but the graphs below show trends in lodging tax receipts before and after the changes in the rule curves. This type of data is not available for the Ontario side of these lakes. Given the common lodging tax rate of 3%, actual lodging receipts would be about 33 times the magnitudes of tax collections. The trend lines compare spring (May + June) to the other ten months for International Falls and Kabetogama, but for Crane Lake the data is better suited for comparing spring to the year's total.

All three areas show a stronger, more consistent performance than is shown in Figure 8 in terms of gross sales at resorts in NE MN. Lodging facilities around International Falls expanded summer-winter lodging receipts by nearly two thirds from 1999 to 2011, but spring sales were

quite flat as shown in Figure 9. This result is consistent with owners' descriptions of difficulty accommodating customers during several Junes since 2000.

Figure 9. Int'l. Falls lodging tax receipts: spring vs. other 10 mos.
(Note: In 2012 the division of lodging taxes within the county changed so the apparent drop in I. Falls business is artificial.)
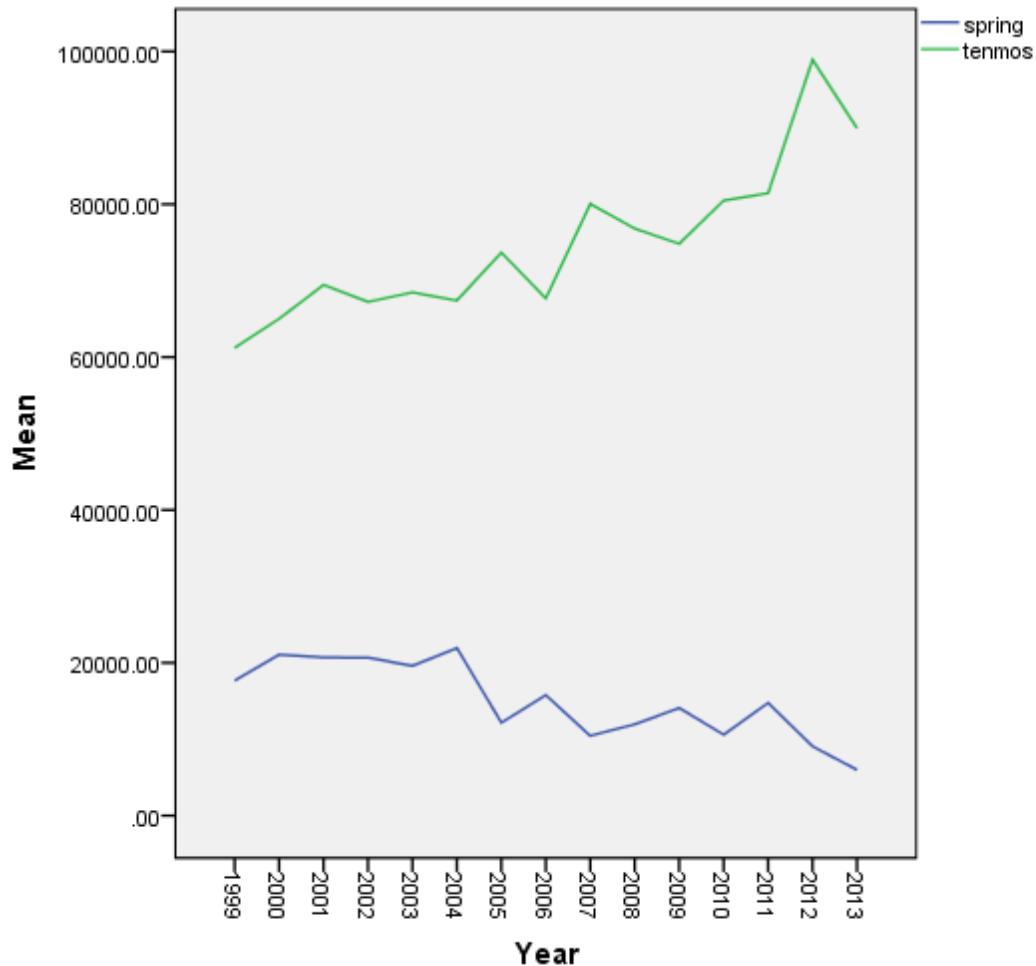
Improving water conditions for spring tourism on Lake Kabetogama was a main purpose of the changes in the 2000 rule curves. To highlight the evidence from the Kabetogama lodging tax, Figure 10 is a scatterplot of spring lodging tax receipts from the early 1990s until the most current year, spanning two decades. Spring receipts show strong growth by roughly doubling over that time, far surpassing the inflation rate. Business the other ten months has expanded even more as illustrated in Figure 11 driven largely by large increases in sales in July, August and September. These increases point to other factors such as economic conditions, changes in angling patterns and relative difficulty of border crossings.

Crane Lake is the other lake on the Namakan Reservoir with major resort business that was targeted for improved spring tourism under the 2000 rule curves. Figure 12 displays trends in spring vs. annual lodging tax receipts over 11 years from 1995 to 2005. (The available data did not support seasonal comparisons after 2005.) From 1995 – 2005, Crane Lake shows immense growth in spring lodging tax receipts from under $5,000 in the mid-to-late 1990s to

Figure 10. Kabetogama lodging tax receipts: spring
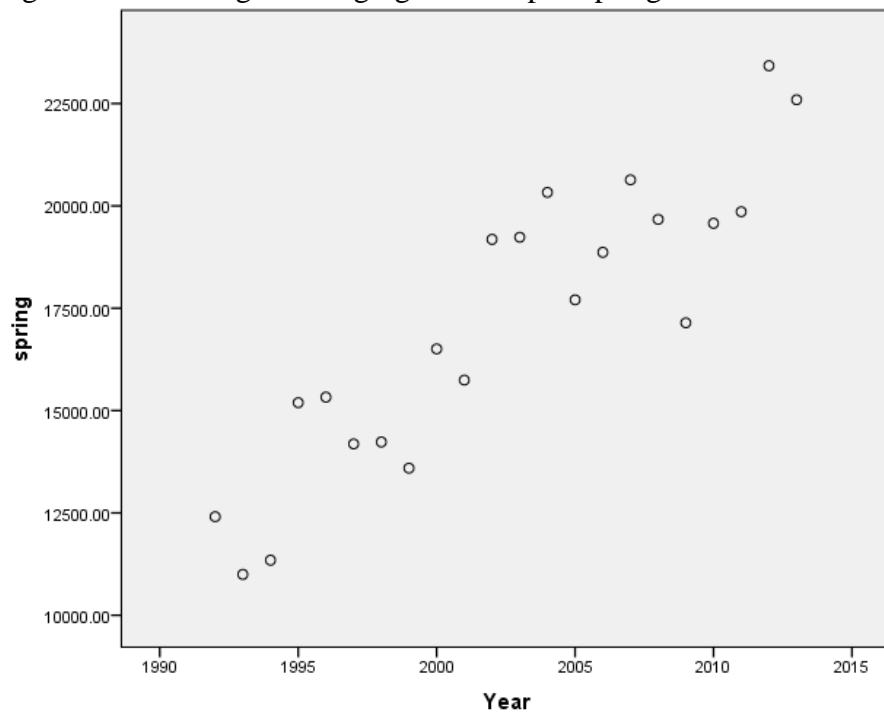
Figure 11. Kabetogama lodging tax receipts: spring vs. other ten months
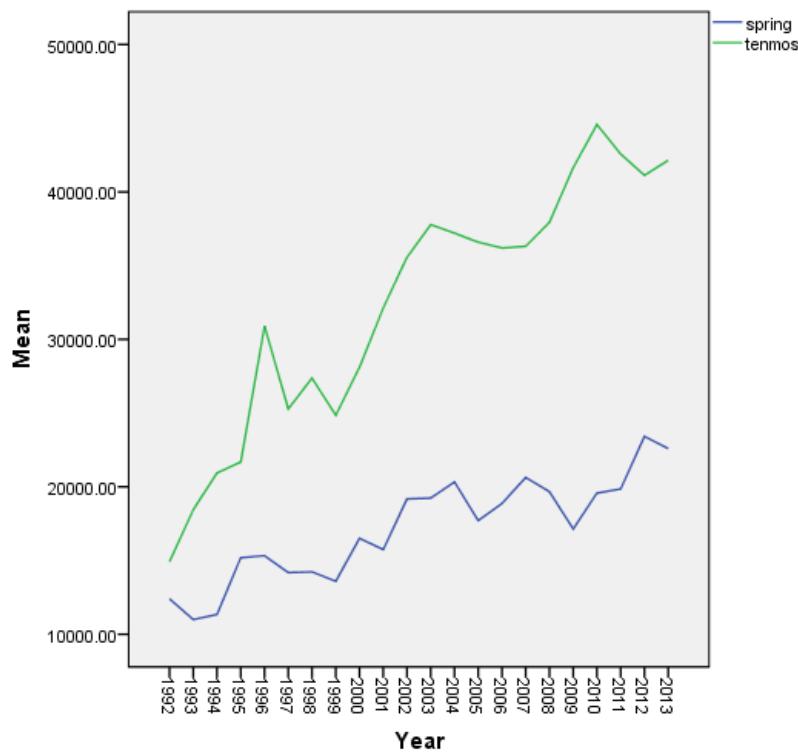
Figure 12. Crane Lake lodging tax receipts: spring vs. total
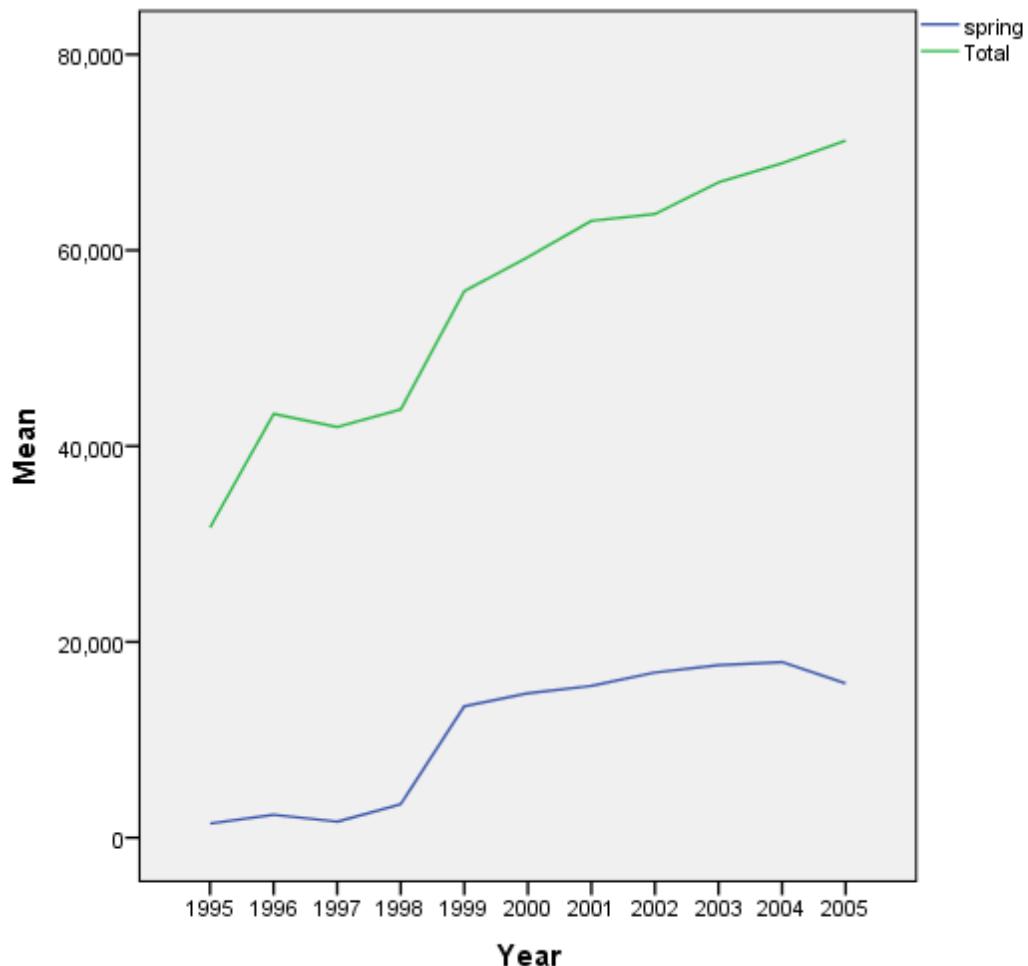
nearly $20,000 in the early 2000s, which is a statistically significant upward trend even when adjusted for inflation. The spring growth contributed to roughly a doubling of total annual receipts over the decade, but the spring growth was much higher than the average for the year. As a percentage of total receipts for the year, spring went from around 5% in the 1990s to around 25% after 2000. The trends in Crane Lake sales shown in Figure 12 indicate a tremendous expansion of tourism sales overall, and a huge increase in performance for spring business.

The evidence from lodging tax receipts complements the sales and occupancy data provided by resort owners in demonstrating a strong positive economic impact on resorts in spring which may be due to higher water levels on the Namakan Reservoir. But even though the trends in lodging sales in the three jurisdictions outperform trends in the larger region of NE MN, these results may not be statistically meaningful. These time series could be influenced by many factors such as recession, exchange rates, angling patterns and customs rules. Application of statistical techniques for comparing time series is limited here due to inadequate data to capture all influences and the low number of years for comparison. Instead NE MN is treated as a control group based on the premise that the region should have experienced tourism influences similar to the study area with a major difference being the rule curve changes.

To control for differential influences over these time periods between NE MN and the study area, the dependent variable is defined as the annual percent change in sales. From 2004 to

2011, the average change in nominal spending in NE MN is 1.07 percent per year. This translates to an average decrease of 1.4 percent per year in real spending when adjusted for inflation. The average annual percent changes in lodging tax receipts for all three jurisdictions are higher than for NE MN but not enough to be statistically significant for t-tests given the small sample size. Comparing mean percentage changes from 2004 – 2011 (n = 28) using Two Way Analysis of Variance on Year and Area does not yield statistically significant differences. Nor does a time-series, multiple regression of yearly percentage changes in sales and explanatory variables Year and three dummies capturing the three lodging tax jurisdictions - treating NE MN as the reference condition.

The time series trends in spring sales for all three lodging tax jurisdictions are significant based on simple regressions against Year. International Falls is different from the other two areas in that spring sales as a percentage of the other 10 months have a negative slope coefficient on Year which is significant at the 1% level, showing spring sales are declining relative to the rest of the year. For Kabetogama, the slope coefficient on Year in explaining real increases in spring lodging tax receipts is positive and significant at the 10% level for a one-tailed test. A simple regression of annual changes in spring sales as a percent of the whole year for Crane Lake is positive and significant at the 1% level.

While these statistical results are suspect given small sample size and complex influences on tourism trends over time, comparisons of trends in year-to-year changes and patterns of spring growth are consistent with improvements due to rule curve changes on the Namakan Reservoir, but suggest worsening conditions in spring relative to the rest of the year on Rainy Lake.

The aggregate picture provides a more comprehensive view than could be gleaned from a subset of individual resorts. These results are consistent with the verbal descriptions of improved business provided by many resorts who could not track specific sales figures going back that far. The expansion of spring lodging tax receipts generally outperformed increases in sales for the rest of the year and strongly outperformed the typical resort trends for NE MN.

DISCUSSION AND IMPLICATIONS

The results show that important features were included in the interview protocol and the typical customers and owners agree that the goals for improvement in the rule curve changes are being met. A major non-monetary measure employed is rating the favorability of the changes. The impacts of the 2000 rule curves are seen as mostly favorable by owners on Kabetogama and Crane Lakes driven by relief from the problems with low levels in spring that were allowable under the 1970 rule curves.

However, respondents on Rainy Lake were far less supportive of the rule curve changes. In multiple parts of the survey, resort owners on Rainy described negative consequences of the high water and fast rise that has occurred during June several years since the rule curve changes. One noteworthy difference is that customers, on average, were less polarized than owners as to whether water level goals have been met.

The negative impacts on Rainy must be recognized as occurring due to levels above the RC max and so are not technically due to the rule curves, but rather to lake levels outside of the rule curves. In contrast, the improvements reported by those on the Namakan Reservoir who appreciate the higher spring levels result from changes that are an expressed purpose of the new management policy.

Owners provide plausible explanations as to why the RC max is being exceeded as frequently as it is. Multiple respondents cited one or more of the following: more heavy rain events/climate change, managers hedging their bets for ample water by targeting the top end of the curve in spring, and incompatibility of the two sets of rule curves: providing high water in the Namakan Reservoir in spring is impossible without exceeding the Rainy Lake RC max in June. The plausibility of these explanations is beyond the scope of this study and is left to the hydrologists to address. But it should come as no surprise that unfavorable impacts would occur when water levels are outside the curves. The positive changes in tourism sales since 2000 need to be highlighted as improvements within the new rule curves while the negative impacts need to be recognized as resulting from levels above the allowable range.

Differences in topography of the lakeshore affect susceptibility to high or low water levels. Many resorts on Rainy Lake are on lakeshore that slopes steadily so that accesses and docks tend to have ample water. The reverse tends to be true of resorts on the Namakan Reservoir, especially those on Kabetogama, where shallow sloping shores in shallow bays are the norm. Water levels can also influence the ease of engaging in activities within Voyageurs National Park such as docking and camping at designated sites. The interviews revealed strong differences between owners on the lakes with a heavy reliance on park visitors on the Namakan Reservoir versus greater dependence on business from local cabin owners on Rainy Lake.

Many resort owners and their long-time customers expressed sensitivity to the low water levels that occurred in springs prior to 2000 and observed improvements since then. The lists of periods outside the curves (based on the Thompson Hydrological Model - Appendix E) show levels that were still too low to be within the 2000 Rule Curve for the Namakan Reservoir for portions of some springs. But the modelled lake levels showed more periods outside the allowable ranges than actually occurred with measured lake levels (Lake of the Woods Control Board, 2015.) To summarize measured lake level violations, periods with levels below the 2000 RC min occurred in 2003, 2006, 2007, 2010 and 2011. For Rainy Lake, the measured levels were below the 2000 RC min for portions of the same years and also 2012. The Rainy Lake occurrences of low water tended to last much longer.

The lists of periods that exceeded the RC maxima in the Namakan Reservoir shows that the maxima were exceeded in eight of the years from 2001 to 2012: the exceptions were 2003, 2006, 2011 and 2012. Actual Rainy Lake water levels exceeded the 2000 RC max for portions of seven years from 2001 to 2012: 2001, 2002, 2005, 2008, 2009, 2011 and 2012.

Given the priority to improve spring water levels on the Namakan Reservoir, it is interesting that respondents did not complain that levels were still too low despite levels being below the 2000 RC Min during five of these years. Their positive responses reflect that absolute water levels have typically gone up enough to improve spring conditions (for using docks, harbors, boat ramps, etc.), meaning they are not hypersensitive to minute detail about levels relative to the allowable minima. In other words, the higher absolute water levels that have occurred recently in most springs compared to pre-2000 levels are seen as a dramatic improvement by many, especially on the Namakan Reservoir lakes. While some resort owners exhibited a high level of vigilance by following water level data online during the time we were conducting interviews in 2014, subtleties in the differences in periods since 2000 when water levels were outside the curves according to the two sets of model results - shown in Appendix E - were too difficult to distinguish for all but the most knowledgeable respondents.

Economic hardship used to occur nearly every spring for resorts on the Namakan Reservoir under the 1970 RC. The larger winter drawdown led to insufficient water levels for

using accesses, docks and harbors in many locations. To repeat for emphasis, these conditions were allowable under the old rule curves so occurred regularly. The POS was prophetic in stressing economic impacts that occur in a typical year, rather than impacts due to exceptional conditions. In setting this priority in 2009, the POS foreshadowed that the 2014 extremes must be regarded differently. While causing incredible hardship in the region, flood conditions of this magnitude have thankfully been a rare occurrence.

That said, the repeat high water events that have occurred on Rainy Lake merit attention. Many owners and customers on Rainy Lake expressed concerns not with the rule curves per se, but with the periods with water levels above the 2000 RC max. Hence, these respondents are less interested in adjustment of the allowable rule curve ranges and more in policy changes that will reduce the occurrences of high water. For the sake of owners and customers on Rainy Lake, remedies should be sought so that levels are not above the Rainy RC max, a different approach than the 2000 changes which actually shifted the Namakan ranges.

Respondents asserted that remedies for problems occurring with the 2000 RC may require another aspect of management beyond the setting of RC Max and Min. The suggestions provided by respondents, especially by highly motivated and knowledgeable owners, point to management in the upper or lower ends of the rule curves depending on conditions. Another layer would be a contingency to go outside the curves, such as an exception to go below the RC min, to be proactive about coming extremes, such as late melt of a deep snowpack as occurred in 2014.

Some who were dismayed with and suggested solutions for the high water on Rainy also expressed empathy with the low water problems in spring under the old rule curves. Almost all who complained about problems with the 2000 RC acknowledged the improvements in spring and the merit of maintaining them. However the suggestion was made by multiple respondents on Rainy that it should not have to receive more water in mid-to-late summer from Namakan than would have occurred under the old curves. Specifically some suggested an exception requiring Namakan to operate under the old ranges for summer drawdown when Rainy is above the RC Max.

While ideas for remedies surfaced during discussions about the 2014 flood, the suggestions in the comments in Appendices C3 and B3 reflect a genuine interest by many to find good faith solutions to the problems that occur with high and low water. Strong evidence in various forms is presented in the Results section demonstrating a stark contrast in the frames of reference between Rainy and the Namakan Reservoir. People on the Namakan Reservoir have historically seen low water as more problematic and people on Rainy are more concerned about high water. Overall the comments indicate a desire to find solutions that are compatible in solving both sets of problems, rather than solving one at the expense of the other.

KEY FINDINGS

   a. Average responses on the favorability of the changes resulting from the 2000 rule curves and agreement that the goals have been met are very supportive. Yet the distributions show variability. Chi-Squared analyses (and independent samples t-tests) show statistically significant differences between the two lake groups: different typical responses for resort owners on the Namakan Reservoir (very supportive) and Rainy (less supportive.) The mean rating for Namakan Reservoir owners is 1.54 (in between

favorable and strongly favorable) while the average for Rainy Lake respondents is 3.64 - on the unfavorable side of neutral.

b. Mean ratings indicate that the goals in the changes are deemed important, general agreement that the goals have been met and satisfaction with the recreational experiences.

c. It is reassuring that the two-dimensional ratings of Importance-Agreement for both owners and customers are all in the NE quadrant, indicating that the rule curves are performing well according to the typical respondent. For the most part, the policy is delivering what respondents find to be important.

d. However the inferential statistics from chi-squared tests (and t-tests on means) demonstrate that there is a significant difference in agreement that the goals are being met between those whose businesses are in the Namakan Reservoir and those on Rainy Lake. Despite little change in the Rule Curves on Rainy there is much less support and agreement that goals have been met there, not only with the extremes this summer but even in prior years with negative impacts reported from high and rapidly rising water levels in June, some of which are measured as above the 2000 RC Max.

e. Evidence from open-ended responses corroborates the finding that the objectives documented in the POS to improve spring conditions on the Namakan Reservoir have been met. Little change was anticipated for the tourism industry on Rainy Lake based on little change between the 1970 and 2000 Rainy Lake rule curves. But the concerns with high water on Rainy outside the curves indicate a more complicated situation and the open-ended comments round out this story.

f. Open-ended comments also provide a more comprehensive perspective on another concern with rule curve changes pertaining to lower drawdown in late summer, particularly regarding navigability of the Loon River.

g. The evidence from lodging tax receipts complements the sales and occupancy data provided by resort owners in demonstrating a strong positive economic impact on resorts in spring due to higher water levels on the Namakan Reservoir. These results are consistent with the verbal descriptions of improved business by many resorts who could not track sales figures going back that far. The expansion of spring lodging tax receipts generally outperformed increases in sales for the rest of the year and strongly outperformed the typical resort trends for NE MN.

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RESORT OWNER TOURISM SURVEY

Instructions:

Prior to arriving for an interview, do the following:

1. In upper left corner write Interview ID#.
2. Make sure the cards and maps are in order.

Hello, my name is _____. I'm from Bemidji State University. We're conducting a study for the International Joint Commission on how management of water levels may influence water-based recreation and tourism on border lakes in this area. The rules governing dam operation on these lakes were changed in 2000 and are referred to as the 2000 Rule Curves. One goal of the changes in the Rule Curves was to improve the suitability of water levels to enhance tourism activity in and around these lakes. The purpose of the study is to understand how changes in the rules for managing water levels since 2000 may have influenced tourism since then. The local watershed committees and tourism boards are collaborating with us on this study. The answers you give to these questions will be used to assist the International Joint Commission with water-level management decisions they are re-evaluating over the next couple of years.

The interview is completely voluntary, and if we come to any questions that you don't want to answer you can tell me to go on to the next question. Would you be willing to help us out by taking some time to answer these questions? (If person asks how long it takes or seems undecided say: "It has been taking people between 10 and 30 minutes depending on how much they have to say." If refusal; check. Note any reason given, list the business & complete the observations section.)

 START INTERVIEW TIME ____:____A.M. or P.M.?

SECTION 1.

Q-1   The first question is, do you own this resort or are you operating it for someone else who owns it?

   1. Owner & operator   97%

   2.   Not owner but operator   3%

Q-2 This study is focusing on changes in water levels due to management policies under the 2000 Rule Curves. Did you have experience with the tourism industry in this area before the 2000 Rule Curves were implemented?

   1.   YES   73.1%
   2.   NO   26.9%

Q-3   What year did you start in this particular resort or business?   _____   Year

Q-4   We would like to know the importance you place on various features of the lakes in this area as they relate to your business and the satisfaction of your customers. Please state the importance you place on water levels using the responses shown on this card.
[Show Card A. After part a is answered insert phrases b – e, "Please state the importance you place on *water quality* using the responses shown on this card."]

The response options are not important at all, not very important, somewhat important, very important, or extremely important?

	NOT IMPORTANT AT ALL 1	NOT VERY IMPORTANT 2	SOMEWHAT IMPORTANT 3	VERY IMPORTANT 4	EXTREMELY IMPORTANT 5	NOT SURE 8
a. water levels			**1** 0% **2** 2% **3** 3%	**4** 40.3%	**5** 53.7%	**8** 3%
b. water quality			**1** 0% **2** 0% **3** 6%	**4** 37.3%	**5** 53.7%	**8** 3%
c. walleye habitat			**1** 0% **2** 0% **3** 4.5%	**4** 40.3%	**5** 52.2%	**8** 3%
d. northern pike habitat			**1** 0% **2** 1.5% **3** 25.4%	**4** 34.3%	**5** 35.8%	**8** 3%
e. wildlife habitat			**1** 0% **2** 1.5% **3** 22.4%	**4** 38.8%	**5** 34.3%	**8** 3%

Q-5 As mentioned earlier, one goal of the 2000 Rule Curves was to make water levels on these lakes more favorable for water-based recreation and tourism. Would you agree that this goal has been met? Please respond Strongly Agree, Agree, Neutral (things are the same), Disagree or Strongly Disagree. [Interviewer: show Card B and circle abbreviation of response on sheet below.]

a. Water levels are more favorable: **SA** 16.4% **A** 25.4% **N** 6% **D** 17.9% **SD** 6% <u>28.4%</u> **no experience pre-2000**

Please choose from the same response options in indicating whether or not you agree that the 2000 Rule Curves have made water quality better:

b. Water quality? **SA** 11.9%   **A** 14.9% **N** 37.3% **D** 6% **SD** 1.5% <u>28.4%</u> **no experience pre-2000**

Please choose from these same response options in indicating whether or not you agree that the 2000 Rule Curves have made the quality of fishing better:

c. Quality of fishing? **SA** 23.9% **A** 19.4% **N** 17.9% **D** 9%   **SD** 1.5% <u>28.4%</u> no experience pre-2000

Other than water levels, water quality and fishing quality are there other conditions that affect your business that have been influenced by the 2000 Rule Curves. If so please list them below.

d._____ SA 20.9% A 7.5% N 3% D 9% SD 17.9% None 41.8%

e._____ SA   A N D SD

f. _____SA   A N D SD

g._____ SA   A N D SD

For each condition, state whether you agree that the 2000 Rule Curves have had a positive impact. Again respond strongly agree to strongly disagree that the Rule Curve impacts have been positive on these other aspects of your business. (Interviewer circle SA to SD above for each aspect.

Q-6 Next we would like you to tell us specific ways water levels have impacted opportunities for boating and other water-based recreation, including ability to use docks and boat launches . Please give specific examples of water levels impacting the suitability of these lakes for boating or other water-based recreation, and please state whether these impacts are positive or negative.

_____

_____

_____

Q-7 [Listen well in case some of this already answered in Q-6 and record it here again.] Next please describe areas on the lake such as shallow bays or reefs or types of shoreline infrastructure such as docks and boat launches that have been hazardous or difficult to use at times depending on the water levels.
a._____ __ low ___ high
b._____ __ low ___ high
c. _____ __ low ___ high
d. _____ __ low ___ high

Next please state whether these areas are more hazardous or difficult to use with low water levels or high water levels? <u>35%</u> low   <u>23.3%</u> high (Both, equally bad 41.7%) [Interviewer record above.]

Q-8 Do you recall particular years or months since the 1990s when these areas were a problem ?
List years/months ___/___   ___/___   ___/___   ___/___   ___/____   ___/___   ___/___   ___/___

Q-9 Considering all of the conditions described above, please rate the overall impact of the 2000 Rule Curves on your business from strongly favorable to strongly unfavorable using the following response options: Strongly favorable, favorable, neutral, unfavorable and strongly unfavorable. [Interviewer circle response above.] **SF** 31.1% **F** 29.5% **N** 16.4% **U** 11.5% **SU** 11.5%

Q-10 Given this rating, we would like to quantify the impact the Rule Curves have had on your sales using two different measures of tourism business: either visitor days per year, annual sales or both. We understand quantifying impacts on sales may be difficult but would like your best estimate for a typical year since 2000. (Be sure owner response is <u>limited to tourism sales, not infrastructure damages</u>. That component will be covered in matrix handed out at Q-12, or here if needed to draw distinction.)

a. Could you estimate the <u>annual change in visitor days</u> your business has experienced due to changes in the Rule Curves? If yes, fill in <u>25.4%</u> more visitor days per year OR <u>23.9%</u> fewer visitor days per year (No change or Not Sure 50.7%)

b. Could you also estimate the <u>percentage change in your annual sales</u> that have occurred due to the 2000 Rule Curves? If yes, fill in _____ % sales + if favorable   _____ % sales - if unfavorable

Q-11 Your business information is private and will only be included in this study to estimate an overall economic impact of the 2000 Rule Curves on resorts and tourism in this area. The responses on dollars of sales will be aggregated for all businesses to allow calculations of aggregate impacts on the area economy and your responses will never be associated with your business. Please check the box on this sheet that corresponds best to your annual sales averaged over the last five years. [If asked, clarify that estimates will be in US dollars.]   (Refused 9%)

__49.3%__ Less than $250,000	__1.5%__ $1.25 million - under $1.5 million
__19.4%__ $250,000 to under $500,000	__3%__ $1.5 million - under $2 million
__9%__ $500,000 to under $750,000	__3%__ $2 million – under $3 million
__3%__ $750,000 - under $1 million	__0%__ $3 million - under $4 million
__3%__ $1 million – under $1.25 million	__0%__ $4 million or more

Q-12 Is there anything else you would like to tell us about the impact of water levels on your business or on your customers satisfaction with their experience? (Our study covers tourism sales, but a separate component is studying damages to infrastructure. **Here is a matrix to record damages to your infrastructure that you can fill out with us now or submit later via mail or electronically to the addresses listed on the sheet.**

_____
_____
_____
_____
_____
_____
_____

Q-13 To better understand the impacts of the 2000 Rule Curves we would like to talk with long-time visitors. Specifically we want to interview tourists who started coming to this area in the 1990s or earlier. Could you refer us to any of your customers who have been coming here that long? It would be most convenient to interview long-time visitors who are staying at your resort today while we are here. Are there any long-time visitors staying here now that you can refer us to? If so, please give names of people here now or provide contact information for those we could interview at another time.

_____
_____
_____

[End interview by expressing gratitude such as:] **THANK YOU FOR PARTICIPATING IN THIS STUDY!!!!**
Interviewer Name:
END INTERVIEW TIME _____ A.M. or P.M.?   DATE: _____

Q-14 Note jurisdiction where business is located   __76.1%__ MN   __23.9%__ Ontario

Q-15   Note respondent's gender.
        MALE   1 65.7%
        FEMALE   2 19.4%
        (Couple 14.9%)

APPENDIX A2: ADDITIONAL STATISTICAL OUTPUT FOR OWNERS

Table A2.1. Means by Lake group: Independent Samples t-tests

	Lakegroup	N	Mean	Std. Deviation	Std. Error Mean
Imp water levels	Namakan Reservoir Lakes	38	4.50	.558	.090
	Rainy Lake MN & ON	27	4.56	.577	.111
IMP water quality	Namakan Reservoir Lakes	38	4.47	.647	.105
	Rainy Lake MN & ON	27	4.52	.580	.112
IMP walleye habitat	Namakan Reservoir Lakes	38	4.58	.500	.081
	Rainy Lake MN & ON	27	4.37	.688	.132
IMP No pike habitat	Namakan Reservoir Lakes	38	4.05	.804	.130
	Rainy Lake MN & ON	27	4.11	.892	.172
IMP wildlife habitat	Namakan Reservoir Lakes	38	4.13	.777	.126
	Rainy Lake MN & ON	27	4.04	.854	.164
Agree Water Level Rec	Namakan Reservoir Lakes	28	4.2143	.87590	.16553
	Rainy Lake MN & ON	20	2.2500	.91047	.20359
Agree Water Quality	Namakan Reservoir Lakes	28	3.8571	.84828	.16031
	Rainy Lake MN & ON	20	2.8000	.69585	.15560
Agree Fishing Quality	Namakan Reservoir Lakes	28	4.4643	.69293	.13095
	Rainy Lake MN & ON	20	2.8000	.83351	.18638
Agree Other Goal	Namakan Reservoir Lakes	24	4.1667	1.16718	.23825
	Rainy Lake MN & ON	15	1.3333	.81650	.21082
favorable?	Namakan Reservoir Lakes	35	1.54	.611	.103
	Rainy Lake MN & ON	26	3.62	1.134	.222

(Strongly Agree = 5, Strongly Disagree = 1)

Table A2.1. (continued)

		t	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Conf. Int.	
						Lower	Upper
Imp water levels	Equal variances assumed	-.390	.698	-.056	.142	-.340	.229
	Equal variances not assumed	-.388	.700	-.056	.143	-.343	.232
IMP water quality	Equal variances assumed	-.287	.775	-.045	.156	-.357	.267
	Equal variances not assumed	-.293	.771	-.045	.153	-.351	.262
IMP walleye habitat	Equal variances assumed	1.417	.162	.209	.147	-.086	.503
	Equal variances not assumed	1.343	.186	.209	.155	-.104	.521
IMP No pike habitat	Equal variances assumed	-.276	.783	-.058	.212	-.482	.365
	Equal variances not assumed	-.271	.787	-.058	.215	-.491	.374
IMP wildlife habitat	Equal variances assumed	.464	.644	.095	.204	-.313	.502
	Equal variances not assumed	.456	.650	.095	.207	-.321	.510
Agree Water Level Rec	Equal variances assumed	7.536	.000*	1.96429	.26066	1.43960	2.48898
	Equal variances not assumed	7.486	.000*	1.96429	.26239	1.43402	2.49455
Agree Water Quality	Equal variances assumed	4.577	.000*	1.05714	.23097	.59223	1.52205
	Equal variances not assumed	4.732	.000*	1.05714	.22340	.60719	1.50709
Agree Fishing Quality	Equal variances assumed	7.537	.000*	1.66429	.22080	1.21984	2.10874
	Equal variances not assumed	7.306	.000*	1.66429	.22778	1.20240	2.12617
Agree Other Goal	Equal variances assumed	8.211	.000*	2.83333	.34506	2.13417	3.53250
	Equal variances not assumed	8.906	.000*	2.83333	.31813	2.18840	3.47827
favorable?	Equal variances assumed	-9.182	.000*	-2.073	.226	-2.524	-1.621
	Equal variances not assumed	-8.452	.000*	-2.073	.245	-2.570	-1.575

* Mean difference significant at the 1% level

APPENDIX A3: OPEN-ENDED COMMENTS FROM RESORT OWNERS

Appendix A3 has been removed from the publically released version of this document for reasons of data sensitivity and personal privacy. Please contact the International Joint Commission for more information.

APPENDIX A4: LIST AND MAP OF RESORTS

Table A4.1. List of Resorts

MN Accommodations (51)

Resort	Address	
Anderson Outfitters	7255 Crane Lake Rd.	Crane Lake, MN 55725
Arrowhead Lodge & Resort	10473 Waltz Rd.	Kabetogama, MN 56669
Ash Riveriera	10351 Ash River Trail	Orr, MN 55771
Ash Trail Lodge	10418 Ash River Trail	Orr, MN 55771
Ash-Ka-Nam Resort	10209 Ash River Trail	Orr, MN 55771
Bear Ridge Guest House	210 Fourth Avenue	International Falls, MN 56649
Birch Grove Resort	10466 Waltz Road	Ray, MN 56669
Birch Point Camp	P.O. Box 236	Ranier, MN 56668
Birchwood Resort	10518 Gamma Rd.	Kabetogama, MN 56669
Camp Idlewood Resort	3033 County Road 20	International Falls, MN 56649
Carlson's Harmony Beach Resort	10002 Gappa Rd.	Ray, MN 56669
Dave's Guide Service	P.O. Box 210	Crane Lake, MN 55725
Driftwood Resort	9961 Blue Waters Way	Kabetogama, MN 56669
Eagle Wing Resort	10042 Gappa Road	Kabetogama, MN 56669
Ebel's Voyageur Houseboats	10326 Ash River Trail	Orr, MN 55771
Frontier Resort	10141 Ash River Trail	Orr, MN 55771
Gateway Resort Outfitters	7614 Gold Coast Rd.	Crane Lake, MN 55725
Grand View Resort/Tall Timber	10479 Waltz Rd.	Kabetogama, MN 56669
Handberg's Marine	7123 Handberg Rd.	Crane Lake, MN 55725
Herseth's Tomahawk Resort	10078 Gappa Rd.	Kabetogama, MN 56669
Island View Lodge & Cabins	1817 Minnesota 11	International Falls, MN 56649
Kabetogama Angling Adventures	9906 Gappa Rd.	Kabetogama, MN 56669
Kec's Kove	10428 Gamma Rd.	Kabetogama, MN 56669
Kettle Falls Hotel	12977 Chippewa Trail	Kabetogama, MN 56669
Moosehorn Resort	10434 Waltz Rd.	Kabetogama, MN 56669

Nelson's Resort	7632 County Road 424	Crane Lake, MN 55725
Northern Lights Resort	10176 Bay Club Dr.	Kabetogama, MN 56669
Northernaire Houseboats Rainy Lake	2690 Co Rd 94	International Falls, MN 56649
North Star Resort	Waltz Rd.	Kabetogama, MN 56669
Norway Lodge	7502 Gold Coast Rd.	Crane Lake, MN 55725
Park Point Resort	9378 Highway 53 #197	Kabetogama, MN 56669
Pine Aire Resort	9978 Gappa Rd.	Kabetogama, MN 56669
Pine Point Lodge & Resort	7533 Gold Coast Rd.	Crane Lake MN, 55725
Pine Tree Cove Resort	12977 Chippewa Trail	Kabetogama, MN 56669
Pines of Kabetogama	12443 Burna Rd.	Kabetogama, MN 56669
Rainy Lake Houseboats	2031 County Road 102	International Falls, MN 56649
Rainy Lake Marina	3080 Ut 225	International Falls, MN 56649
Sandy Point Lodge & Outfitters	10606 Gamma Rd.	Ray, MN 56669
Scott's Peaceful Valley Resort	7559 Gold Coast Rd.	Crane Lake, MN 55725
Scott's Resort & Seaplane Base	7546 Gold Coast Rd.	Crane Lake, MN 55725
Sha-Sha Resort	1664 Minnesota 11, P.O. Box	International Falls, MN 56649
Snyder's Idlewild Resort	10060 Gappa Rd.	Kabetogama, MN 56669
Sunset Resort Campground	10294 Ash River Trail	Orr, MN 55771
Tara's Rainy Lake Inn & Suites	333, 2065 Spruce St Landing	Ranier, MN 56668
Thunderbird Lodge	2170 County Road 139	International Falls, MN 56649
Voyagaire Lodge & Houseboats	7576 Gold Coast Rd.	Crane Lake, MN 55725
Voyageur Park Lodge	10436 Waltz Rd.	Ray, MN 56669
Voyageurs Landing Resort	7510 Gold Coast Rd.	Crane Lake, MN 55725
Voyageur's Sunrise Resort	12475 Burma Rd.	Kabetogama, MN 56669
WoodsPort Cottages	P.O. Box 461	Rainier, MN 56668
Woody's Rainy Lake Resort	3481 Main St.	Ranier, MN 56668

Ontario Accommodations (16)
67 Total

Amik Lodge	Box 83	Emo ON P0W 1E0 Canada

Camp Narrows Lodge	Box 807	Fort Frances, ON P9A 3N1 Canada
Campfire Island Camp	Box 476	Fort Frances, ON P9A 3M8 Canada
Cascades Camps Ltd	Box 657	Fort Frances ON P9A 3M9 Canada
Coppen's Resort	Site 300-1 RR 3	Fort Frances, ON P9A 0A1 Canada
LaBelle's Birch Point Camp	R.R. #1	Devlin, ON P0W 1C0 Canada
LaPlace Rendezvous Hotel & Resort	Hwy 11 East	Fort Frances, ON P9A 3M3 Canada
Lake Despair Lodge	PO Box 130	Devlin, ON P0W 1C0 Canada
Point O Pines Camp	404 Butler Avenue	Fort Frances, ON P9A 2N9 Canada
Silver Muskie Lodge	PO Box 1148	International Falls, MN 56649
Stokes Bay Resort	3065 East Arm Lane	Ely MN 55731
Taylor's Cove Ltd.	Box 57	Fort Frances, ON P9A 3M5 Canada
The Fisheries Resort	Site 300-15 RR3	Fort Frances ON P9A 0A1 Canada
The Landing	PO Box 36 Stn Main	Fort Frances, ON P9A 3M5 Canada
Sand Point Lodge	Rt. 3, Box 108	Crane Lake, MN 55725
Spawn Inlet Lodge	Red Gut Bay	Fort Frances ON, P9A 3M8 Canada

Rainy Lake, Namakan Lake, Kabetogama Lake, Crane Lake, and Ash River Resort Locations
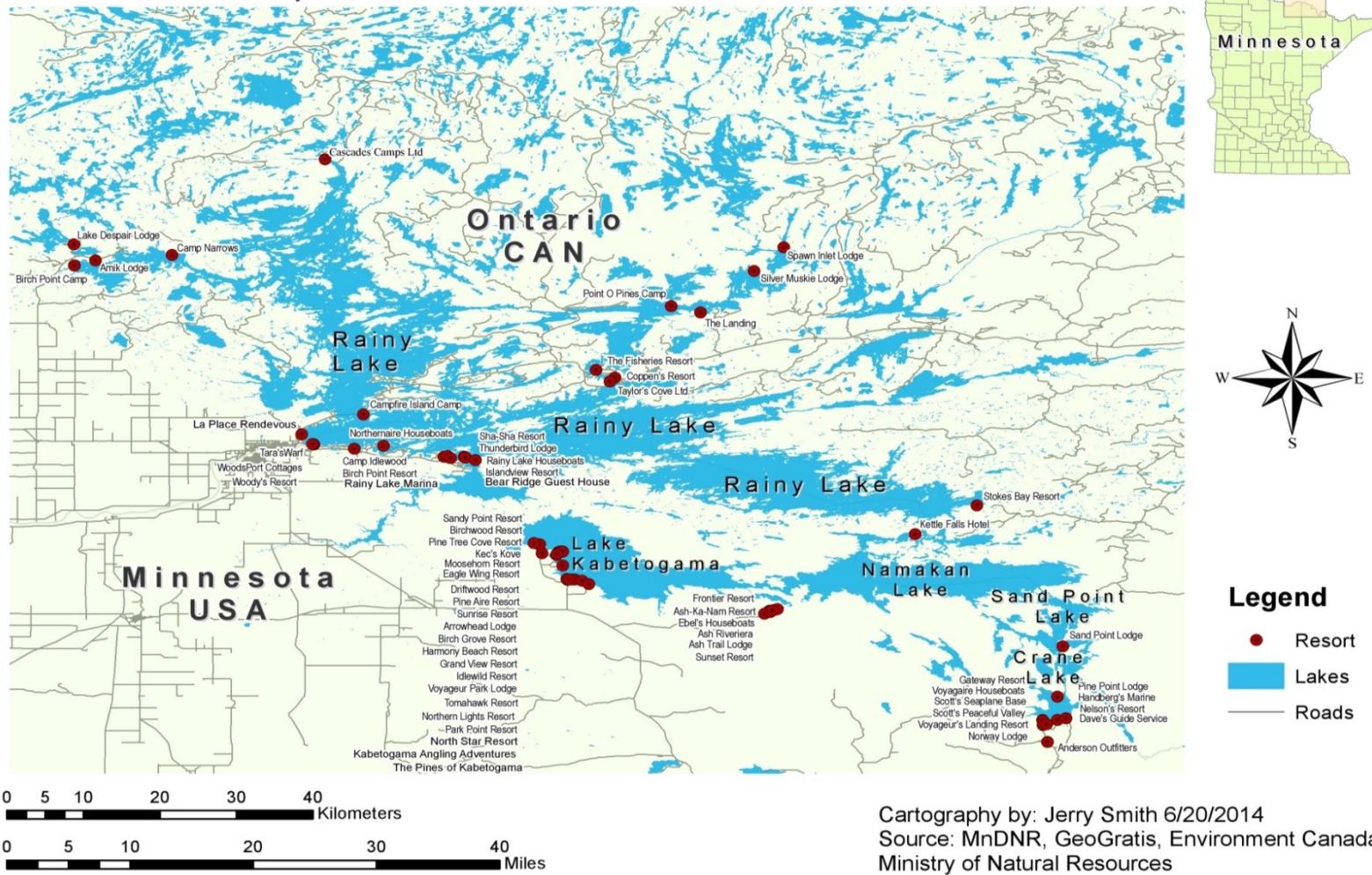
RESORT CUSTOMER TOURISM SURVEY

Instructions:
Prior to arriving for an interview, do the following:
3. In upper left corner write Interview ID#.
4. Make sure the cards are in order.

Hello, my name is _____. I'm from Bemidji State University. We're conducting a study for the International Joint Commission on how management of water levels may influence water-based recreation and tourism on border lakes in this area. The purpose of the study is to understand how changes in the rules for managing water levels since 2000 may have influenced tourism activities since then. The local watershed committees and tourism boards are collaborating with us on this study. The answers you give to these questions will be used to assist the International Joint Commission with management decisions being re-evaluated over the next couple of years. You were recommended to us as a long-time visitor to this area. We want to interview tourists who started coming to this area in the 1990s or earlier. Did you start coming to this area before the year 2000? If yes, ___ check here and continue. **If not**, end introduction, **END INTERVIEW** and says thanks.

The interview is completely voluntary, and if we come to any questions that you don't want to answer you can tell me to go on to the next question. Would you be willing to help us out by taking some time to answer these questions? (If person asks how long it takes or seems undecided say: "It has been taking people between 10 and 30 minutes depending on how much they have to say." If refusal; check . Note any reason given & complete the observations section.)

  START INTERVIEW TIME ____:____A.M. or P.M.?

SECTION 1.
Q-1. What year did you start coming to this area?   _____ Year

Q-2. We would like to know the importance you place on various features of the lakes in this area as they relate to your enjoyment. Please state the importance you place on water levels for your recreational experience using the responses shown on this card. [Show Card A. After part a is answered insert phrases b – e, "Please state the importance you place on *water quality* using the responses shown on this card."]   The response options are not important at all, not very important, somewhat important, very important, or extremely important?

	NOT IMPORTANT AT ALL	NOT VERY IMPORTANT	SOMEWHAT IMPORTANT	VERY IMPORTANT	EXTREMELY IMPORTANT	NOT SURE
	1	2	3	4	5	8
a. water levels		**1** 0%	**2** 3.8% **3** 7.5%	**4** 50.9%	**5** 35.8%	**8** 1.9%
b. water quality		**1** 0%	**2** 3.8% **3** 0%	**4** 47.2%	**5** 47.2%	**8** 1.9%
c. walleye habitat		**1** 0%	**2** 0% **3** 9.4%	**4** 35.8%	**5** 52.8%	**8** 1.9%
d. northern pike habitat		**1** 3.8%	**2** 5.7% **3** 32.1%	**4** 32.1%	**5** 24.5%	**8** 1.9%
e. wildlife habitat		**1** 1.9%	**2** 3.8% **3** 11.3%	**4** 45.3%	**5** 35.8%	**8** 1.9%

Q-3 A goal of the 2000 Rule Curves (policies for water-level management) was to make water levels more favorable for water-based recreation and tourism. Would you agree that this goal has been met? Please respond Strongly Agree, Agree, Neutral (things are the same), Disagree or Strongly Disagree. [Interviewer: show Card B and circle abbreviation of response on sheet below.]

    d. Water levels are more favorable: **SA** 28.3% **A** 37.7% **N** 18.9% **D** 7.5% **SD** 7.5%

Please choose from the same response options in indicating whether or not you agree that the 2000 Rule Curves have made water quality better:

    e. Water quality?   **SA** 13.5% **A** 38.5% **N** 42.3% **D** 3.8% **SD** 1.9%

Please choose from these same response options in indicating whether or not you agree that the 2000 Rule Curves have made the quality of fishing better:

    f. Quality of fishing? **SA** 28.8% **A** 26.9% **N** 30.8% **D** 13.5% **SD** 0%

Other than water levels, water quality and fishing quality, are there other aspects of your tourist experience that have been influenced by the 2000 Rule Curves. If so, please list them below.

d._____SA 17% A 11.3% N 3.8% D 1.9% SD 3.8% (None 62.3%)

e._____SA A N D SD

f. _____SA A N D SD

g._____SA A N D SD
For each aspect, state whether you agree that the 2000 Rule Curves have had a positive impact, again responding strongly agree to strongly disagree that the Rule Curve impacts have been positive on these aspects. [Interviewer circle SA to SD above for each aspect.]

Q-4 Next we would like you to tell us specific ways water levels have impacted opportunities for boating and other water-based recreation, including ability to use docks and boat launches . Please give specific examples of water levels impacting the suitability of these lakes for boating or other water-based recreation, and please state whether these impacts are positive or negative.
_____
_____
_____
Q-5 [Listen well in case some of this already answered in Q-4 and record it here again.] Next please describe areas on the lake such as shallow bays and reefs or shoreline infrastructure such as docks and boat launches, that have been hazardous or difficult to use at times depending on the water levels.
a._____ __ low ___ high
b._____ __ low ___ high
c. _____ __ low ___ high
d. _____ __ low ___ high

Next please state whether these areas are more hazardous or difficult to use with low water levels or high water levels? __60.9%_ low ___15.2%__ high (Both, equally bad 23.9%) [Interviewer record above.]

Q-6 Do you recall particular years or months since the 1990s when these areas were a problem ?
List years/months ___/___   ___/___   ___/___   ___/___   ___/____   ___/___   ___/___   ___/___

Q-7 Considering all of the conditions described above, please rate the overall impact of the 2000 Rule Curves on your visitor experience from strongly favorable to strongly unfavorable using the following response options: Strongly favorable, favorable, neutral, unfavorable and strongly unfavorable. [Interviewer circle response above.] **SF** 37% **F 3**9.1% **N** 13% **U** 4.3% **SU** 6.5%

The next series of questions is about your recreational uses of lakes in this area and your attitudes about the influence of water levels and water quality on your recreational experiences.

Q-8. Do you personally use Rainy Lake, Namakan Lake, Lake Kabetogama, Sand Point Lake, Crane Lake or Little Vermilion Lake for water-based recreation?
    1. Yes   100%
    2. NO (If NO circle NO, then skip next table and go to question Q-9) 0%

Please tell me which of the lakes you use for recreation. Also the type of recreation you do on each lake.   Please identify each lake where you do each of the recreational activities. (Show Card 1 Rec.) (The numbers shown are the raw scores of responses out of 53 customers.)

		Use Lake	Fishing	Pleasure Boating	Sailing	Water Skiing	Swimming	Sight-seeing	Other Water Based Recreation
Q-8a	Rainy Lake	35	33	23	0	5	12	27	8
Q-8b	Namakan Lake	29	27	24	0	2	12	26	4
Q-8c	Lake Kabetogama	36	36	30	0	11	17	29	12
Q-8d	Sand Point Lake	12	8	9	0	2	4	10	2
Q-8e	Crane Lake	14	10	13	0	5	6	12	3
Q-8f	Little Vermilion Lk	3	2	2	0	0	0	3	1

Q-8g. Referring to the table above, please tell me the name of the lake which you use most for recreation.

Q-8h. Also indicate the type of recreation you do most often on all lakes combined.

Q-9. How many days a year do you visit in this area? _____ days per year

Q-10. Please consider the amount you and your immediate party will spend in this area on this trip. Approximately how much will you spend (per person) in a typical day to recreate on the lakes in this area, rounded to the nearest $50? (Examples of expenses might be: lodging, bait, gas for the boat, travel expenses, licenses, etc. Remind respondent these expenses are per person, per day.) [If asked, clarify that estimates will be in US dollars.]

1. Less than $50.00   16%

2. $50 to under $100   44%

3. $100 to under $150   22%

4. $150 to under $200   8%

5. $200 to under $250   0%

6. $250 to under $300   4%

7. $300 or more   6%

Q-11. How satisfied are you with the quality of your recreational experience on these lakes? (Show Card   2 Rec. for next series of questions.)

1. Extremely Dissatisfied   2%

2. Somewhat Dissatisfied   3.9%

3. Neither Dissatisfied nor Satisfied   0%

4. Somewhat Satisfied   15.7%

5. Extremely Satisfied   78.4%

Q-12 How satisfied are you with the water quality in relation to your recreational use of the lakes?

1. Extremely Dissatisfied   0%

2. Somewhat Dissatisfied   3.9%

3. Neither Dissatisfied nor Satisfied   0%

4. Somewhat Satisfied   45.1%

5. Extremely Satisfied   51%

Q-13. **(Ask only of those who said they fished in Q-8)**. Being one of your recreational activities identified in Q-8 was fishing, how satisfied are you with the quality of your fishing experience on these lakes? (Card 2 still.)

1. Extremely Dissatisfied   0%

2. Somewhat Dissatisfied   3.8%

3. Neither Dissatisfied nor Satisfied   5.8%

4. Somewhat Satisfied   46.2%

5. Extremely Satisfied **(Please skip to question 14a)**   44.2%

Q-13b (**Ask if answered 1-4 to Q-13**) Given you are **not** extremely satisfied with your fishing, what do you feel is the reason for your lack of satisfaction with your fishing experience on these lakes? (Show Card 3.)

      1. Poor Water Quality.   3.6%

      2. Poor Habitat for the Fish for Reproduction.   7.1%

      3. Excessive Cutting of Aquatic Vegetation.   0%

      4. Over Harvesting of the Fishery.   10.7%

      5. Other, please describe _____78.6%_____

Q-14a Consider the overall impact of the 2000 Rule Curves on your visitor experience and whether it has resulted in your changing the number of days you visit in this area. Are you visiting the area _24.5%_ more days since 2000, 73.5% the same amount or 2%_fewer days due to the Rule Curves.

      Q-14B. If more or fewer days, ask *the change in the number* ___ of days per year.

The remaining questions ask for demographic information and will only be used in aggregate to better understand the characteristics of long-time visitors to this area. Your individual responses will only be lumped in for aggregate information for all of the long-time visitors we are interviewing.

Q-15   What country do you reside in? _____US 98.1%_____Canada 1.9%_____

      Q-15a If **USA**, Are you a Minnesota resident?
      YES   1   65.4%
      NO   2   34.6% (If NO, What state do you reside in? Q15State _____
      NOT SURE 8

      If **Canada** Q-15b   Are you an Ontario resident?
      YES   1   1.9%
      NO   2   98.1% (If NO, What province do you reside in? Q15Prov_____
      NOT SURE 8

Q-16 In what year were you born? _____   [Allow respondent to fill in answers on this series if they prefer: also note if NS = not sure, R = refusal.]

Q-17 Gender.
      MALE   1   83%
      FEMALE   2   7.5%
      (Couple 9.4%)

Q-18 Including yourself, what is the total number of visitors in your party?
      _____PEOPLE
Q-19 How many people in your party are younger than 18?
      _____ PEOPLE

For the next question, I'd like you to think about all the sources of income received by your household during 2013. [Show Card 4: income categories with letters on it. Again may allow respondent to circle number of category on interview form.]

Q-20   Which letter on this card best describes your household's total income for last year (2013) before taxes? [Circle number below or check here ___ if not sure. Again note US dollars.]
[Categories on card are increments of $5,000, for privacy can have respondent circle letter where $ ranges not shown on interview form.]   (No answer from 13.2%)

A	1	UNDER $5,000	0%
B	2	$5,000 TO $9,999	0%
C	3	$10,000 TO $14,999	1.9%
D	4	$15,000 TO $19,999	0%
E	5	$20,000 TO $24,999	0%
F	6	$25,000 TO $29,999	1.9%
G	7	$30,000 TO $34,999	1.9%
H	8	$35,000 TO $39,999	1.9%
I	9	$40,000 TO $44,999	9.4%
J	10	$45,000 TO $49,999	1.9%
K	11	$50,000 TO $54,999	3.8%
L	12	$55,000 TO $59,999	0%
M	13	$60,000 TO $64,999	0%
N	14	$65,000 TO $69,999	1.9%
O	15	$70,000 TO $74,999	11.3%
P	16	$75,000 TO $79,999	5.7%
Q	17	$80,000 TO $84,999	3.8%
R	18	$85,000 TO $89,999	3.8%
S	19	$90,000 TO $94,999	3.8%
T	20	$95,000 TO $99,999	3.8%
U	21	$100,000 OR MORE	30.2%

Q-21   Is there anything else you would like to tell us about the impact of water levels on your visitor experience? _____

_____

_____

[End interview by expressing gratitude such as:] **THANK YOU FOR PARTICIPATING IN THIS STUDY!!!!**
Interviewer Name:

END INTERVIEW TIME _____ A.M. or P.M.?   Date: _____

Q-22 Note jurisdiction where business is located   __82.7%___   MN   __17.3%___   Ontario

Table B2.1. Year first visited

Year first visited	Frequency	Valid Percent
1948	1	1.9
1953	1	1.9
1957	1	1.9
1958	1	1.9
1961	2	3.8
1964	1	1.9
1965	2	3.8
1967	1	1.9
1968	1	1.9
1969	3	5.7
1970	2	3.8
1971	1	1.9
1972	1	1.9
1973	1	1.9
1974	1	1.9
1976	1	1.9
1977	2	3.8
1978	1	1.9
1980	2	3.8
1981	1	1.9
1982	2	3.8
1983	2	3.8
1984	3	5.7
1985	2	3.8
1986	2	3.8
1987	2	3.8
1988	1	1.9
1989	1	1.9
1990	2	3.8
1992	2	3.8
1993	1	1.9
1995	4	7.5
1998	1	1.9
2000	1	1.9
Total	53	100%

Table B2.2. Agreement that other goals have been met

Agree other goal met	Frequency	Valid Percent
Strongly Agree	9	45
Agree	6	30
Neutral	2	10
Disagree	1	5
Strongly Disagree	2	10
Total	20	100%

Table B2.3. Other recreational activities mentioned

Other Use	Frequency	Valid Percent
camping	1	6.25
camping & picnics	1	6.25
canoeing	1	6.25
commercial travel	1	6.25
houseboat camping	1	6.25
kayaking	1	6.25
kayaking & tubing	1	6.25
kayaking, tubing, wake boarding	1	6.25
picnic	1	6.25
snorkel, picnic	1	6.25
snowmobiling and ice fishing	1	6.25
taking pictures	1	6.25
tubing	3	18.75
tubing, kayaking	1	6.25
Total	16	100%

Table B2.4. Other States Where Customers Reside

Other State		
	Frequency	Valid Percent
AZ	1	6.25
FL	1	6.25
IA	4	25
IL	5	31.25
MI	1	6.25
MO	1	6.25
OK	1	6.25
WI	2	12.5
Total	16	100%

Table B2.5. Party Size

party size		
	Frequency	Valid Percent
1	1	1.9
2	9	17.3
3	4	7.7
4	8	15.4
5	8	15.4
6	3	5.8
7	5	9.6
8	3	5.8
9	2	3.8
10	2	3.8
11	3	5.8
12	1	1.9
14	1	1.9
15	1	1.9
22	1	1.9
Total	52	100%

Table B2.6. Number of Children in Party

# children	Frequency	Valid Percent
0	32	62.7
1	6	11.8
2	7	13.7
4	1	2
5	2	3.9
6	2	3.9
12	1	2
Total	51	100%

APPENDIX B3: OPEN-ENDED COMMENTS FROM LONG-TIME CUSTOMERS

Appendix B3 has been removed from the publically released version of this document for reasons of data sensitivity and personal privacy. Please contact the International Joint Commission for more information.

Cards A – C used for resort owner interviews. All seven cards used for customer interviews.

Not Important At All

Not Very Important

Somewhat Important

Very Important   A

Extremely Important

Strongly Agree

Agree

Neutral (things are the same or Not Sure)

Disagree

Strongly Disagree

B

Strongly Favorable

Favorable

Neutral (things are the same or Not Sure)

Unfavorable

Strongly Unfavorable

C

CARD 1 REC

		Fishing	Pleasure Boating	Sailing	Water Skiing	Swimming	Sight-seeing	Other Water Based Recreation
Q-8a	Rainy Lake	O	O	O	O	O	O	O
Q-8b	Namakan Lake	O	O	O	O	O	O	O
Q-8c	Lake Kabetogama	O	O	O	O	O	O	O
Q-8d	Sand Point Lake	O	O	O	O	O	O	O
Q-8e	Crane Lake	O	O	O	O	O	O	O
Q-8f	Little Vermilion Lake	O	O	O	O	O	O	O

1. Extremely Dissatisfied

2. Somewhat Dissatisfied

3. Neither Dissatisfied nor Satisfied

4. Somewhat Satisfied

5. Extremely Satisfied

D

1. Poor Water, Quality
2. Poor Habitat for the Fish for Reproduction
3. Excessive Cutting of Aquatic Vegetation
4. Over Harvesting of the Fishery
5. Other, please describe

_____

E

A	UNDER $5,000
B	$5,000 TO $9,999
C	$10,000 TO $14,999
D	$15,000 TO $19,999
E	$20,000 TO $24,999
F	$25,000 TO $29,999
G	$30,000 TO $34,999
H	$35,000 T0$39,999
I	$40,000 TO $44,999
J	$45,000 TO $49,999
K	$50,000TO$54,999
L	$55,000 TO $59,999
M	$60,000 TO $64,999
N	$65,000 TO $69,999
O	$70,000 TO $74,999
P	$75,000 TO $79,999
Q	$80,000 TO $84,999
R	$85,000 TO $89,999
S	$90,000 TO $94,999
T	$95,000 TO $99,999
U	$100,000 OR MORE

S

curves for both lakes. Comparisons of the 2000 Rule Curves and 1970 Rule Curves for Rainy Lake and Namakan Lake are shown in **Figures 2 and 3**, respectively.

**Figure 2: The 2000 Rule Curves for Rainy Lake Compared to the 1970 Rule Curves.**
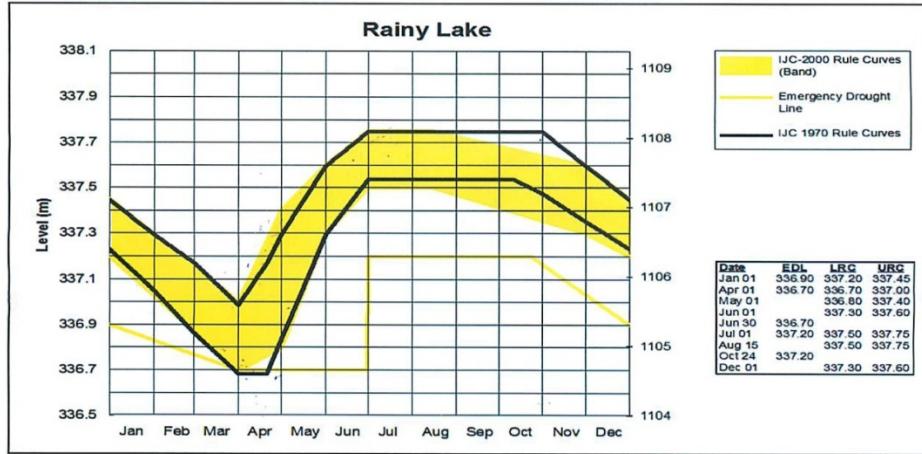

Figure 3: The 2000 Rule Curves for Namakan Lake Compared to the 1970 Rule Curves.
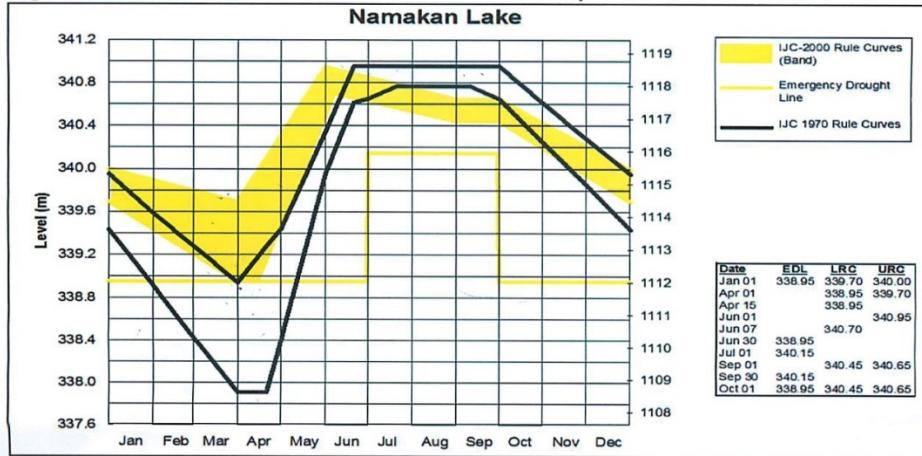
APPENDIX E

List of Quarter Monthly Periods When Water Levels were Below the RC Minimum or Above the RC Maximum: Based on Results from Aaron Thompson Hydrological Model

*Periods coded Blue (Water level **below RC minimum**: <u>Namakan Model 2000RC</u>) listed by beginning date*

5-8-02
5-22-02
6-8-02
5-8 to 7-22-03
5-8 to 6-15-04
5-8 to 6-8-05
5-8 to 6-15-06
5-8 to 6-15-07
5-8 to 7-8-10
5-15 to 6-15-11
5-8 to 6-15-12

*Periods coded Blue (Water level **below RC minimum**: <u>Rainy Lake Model 2000RC</u>) listed by beginning date*

5-22 to 6-8-02
5-8 to 6-8-03
6-15 to 10-8-03 (purple, below drought line)
10-15 and 10-22-03
5-31-04
5-31-05
5-31-06
9-15 to 10-15-06
10-22 to 11-15-06 (purple, below drought line)
11-22-06 to 1-22-07
1-31-07 (purple, below drought line)
2-8-07
2-15 to 2-28-07
3-8-07
3-15-07 (purple, below drought line)
4-22 to 7-8-07
5-8 to 7-15-10
5-31-11
10-8 to 12-31-11 and on to 2-15-12
5-31-12
10-22-12

*Periods coded Blue (Water level **below RC minimum**: <u>Namakan Model 1970RC</u>) listed by beginning date*

5-8-to 7-22-02 *(periods 5-15, 5-31 and 6-15 to 7-22 not listed as below the 2000RC min)* 5-8 to 8-31-03 *(periods 7-29 to 8-31 not listed as below the 2000RC min)*
5-31 to 7-22-04 *(periods 6-22 to 7-22 not listed as below the 2000RC min, but 5-8 to 5-22 added)*
5-22 to 5-31-05
6-15 to 6-30-05 *(these periods not listed as below the 2000RC min, but 5-8 to 6-8 added)*
5-22 to 6-30-06 *(periods 6-22 and 6-30 not listed as below the 2000RC min, but 5-8 and 5-15 added)*
5-8 to 7-22-07 *(periods 6-22 to 7-22 not listed as below the 2000RC min)*
5-8 to 8-8-10 *(periods 7-15 to 8-8 not listed as below the 2000RC min)*
5-31 to 7-22-11 *(periods 6-22 to 7-22 not listed as below the 2000RC min, but 5-15 and 5-22 added)*
5-15 to 7-22-12 *(periods 6-22 to 7-22 not listed as below the 2000RC min, but 5-8 added)*

*Periods coded Blue (Water level **below RC minimum**: <u>Rainy Lake Model 1970RC</u>) listed by beginning date*

5-22 to 6-15-02 *(period 6-15 not listed as below the 2000RC min)*
10-15-02 *(this period not listed as below the 2000RC min)*
5-8 to 12-15-03 *(periods 10-31 to 12-15 not listed as below the 2000RC min)*
5-22 to 6-8-04 *(periods not listed as below the 2000RC min)*
6-22 to 6-30-04 *(periods not listed as below the 2000RC min)*
5-31-05
5-22-06 *(this period not listed as below the 2000RC min, but 5-31added)*
6-30-06 *(this period not listed as below the 2000RC min)*
9-8 to 12-31-06 and on to 7-15-07 *(periods 9-8, 3-22 to 4-15-07 and 7-15-07not listed as below the 2000RC min)*
9-15 to 9-30-07 *(periods not listed as below the 2000RC min)*
5-8 to 7-22-10 *(period 7-22 not listed as below the 2000RC min)*
5-31-11
9-22 to 12-31-11 and on to 1-22-12 *(periods 9-22 and 9-29 not listed as below the 2000RC min, but periods 1-29-12 to 2-15-12 added)*
5-22 to 5-31-12 *(periods not listed as below the 2000RC min)*
6-22 to 6-30-12 *(periods not listed as below the 2000RC min)*
9-30 to 11-15-12 *(period 10-22 is the only one listed as below the 2000RC min)*

*Periods coded Yellow (Water level **above RC maximum**: <u>Namakan Model 2000RC</u>) listed by beginning date*

5-22-01
5-31 to 6-15 (red, above all gates open)
 6-22 to 7-8-01
10-22-01 to 10-31-01
12-31-01
10-22 to 10-31-02
12-31-02
10-22 10-31-03
11-22 to 11-30-03
12-31-03
10-22 to 10-31-04
11-22 to 11-30-04
12-31-04
10-22 to 10-31-05
11-22 to 11-30-05
12-31-05
 10-31-06
11-22 to 11-30-06
12-31-06
 10-22 to 12-31-07
6-8 to 7-22-08 with period of 6-22-08 (red, above all gates open)
10-22 to 10-31-08
11-22 to 11-30-08
12-31-08
10-22 to 10-31-09
11-22 to 11-30-09
12-31-09
 10-22 to 10-31-10
11-22 to 11-30-10
12-31-10
 10-22 to 10-31-11
11-22 to 11-30-11
12-31-11
 10-22 to 10-31-12

11-22 to 11-30-12
12-31-12

*Periods coded Yellow (Water level **above RC maximum:** Rainy Lake Model 2000RC) listed by beginning date*

5-22 to 7-8-01 with periods of 6-8 to 6-30-01 (red, above all gates open)
8-15 to 8-22-01
8-8-02
6-15 to 6-30-05
6-15-08
6-22 to 7-15-08 (red, above all gates open)
7-22 to 7-31-08
5-31 to 6-22-09

*Periods coded Yellow (Water level **above RC maximum:** Namakan Model 1970RC) listed by beginning date*

5-8 to 6-30-01 with periods 6-8 & 6-15 (red, above all gates open, *periods 5-8 to 5-21 not listed as above the 2000RC max*)
10-22-01 to 10-31-01
11-22 to 11-30-01 *(periods not listed as above the 2000RC max, but 12-31 added)*
10-22 to 10-31-02
11-22 to 11-30-02 *(periods not listed as above the 2000RC max, but 12-31 added)*
10-22 10-31-03
11-22 to 11-30-03 *(period 12-31 added as above the 2000RC max)*
11-22 to 11-30-03
10-22 to 10-31-04
11-22 to 11-30-04 *(period 12-31 added as above the 2000RC max)*
10-22 to 10-31-05
11-22 to 11-30-05 *(period 12-31 added as above the 2000RC max)*
10-22 to 10-31-06 *(period 10-22 not listed as above the 2000RC max, but 12-31 added)*
11-22 to 11-30-06
10-22 to 12-8-07 *(periods 12-15 to 12-31 added as above the 2000RC max)*
5-22 to 7-8-08 with period of 6-22-08 (red, above all gates open, *periods 5-22 and 5-29 not listed as above the 2000RC max, but 7-15 and 7-22 added))*
10-22 to 10-31-08
11-22 to 11-30-08 *(period 12-31 added as above the 2000RC max)*
5-8 to 6-8-09 *(periods not listed as above the 2000RC max)*
10-22 to 10-31-09
11-22 to 11-30-09 *(period 12-31 added as above the 2000RC max)*
10-22 to 10-31-10
11-22 to 11-30-10 *(period 12-31 added as above the 2000RC max)*
10-22 to 10-31-11
11-22 to 11-30-11 *(period 12-31 added as above the 2000RC max)*
10-22 to 10-31-12
11-22 to 11-30-12 *(period 12-31 added as above the 2000RC max)*

*Periods coded Yellow (Water level **above RC maximum:** Rainy Lake Model 1970RC) listed by beginning date*

5-22 to 7-8-01 with periods of 6-8 to 6-30-01 (red, above all gates open)
8-15 to 8-22-01
6-22 to 7-31-02 (red, above all gates open, *periods not listed as above the 2000RC max*)
8-8-02
7-8-04 *(period not listed as above the 2000RC max)*
6-15 to 6-30-05
6-15-08 to 7-31-08 with periods 6-22 to 7-15-08 (red, above all gates open)
5-31 to 6-22-09

APPENDIX F: REPRESENTATIVE COMMENTS BY TOPIC

OWNERS: Business Conditions

– Improved tourism spring and fall, more predictable means better repeat business, maintained instead of losses in 90s. If customers have good experience, we get repeat business; extremes used to cause lost customers, especially in May

– Can't measure, be amazed if others can, so many other factors

– Customers used to call in April "can we put our boats at docks," 2000 curves give every resorter opportunity to be open for business and provide lake and dock access for customers much better than old curve, before 2000 always questionable

– 2014 has been severely affected because of both media and word of mouth, every other year is a flood, high frozen water destroying both docks and rice, wildlife habitat being destroyed, 2014 June down 65%.

– It has cast a bad light on all of the resorts up here, inconsistencies in water levels have harmed repeat customers, it can be very demoralizing, inspiration and hope are hard to find, not just 2014 but almost every year.

– The month of May has improved on Crane Lake since 1998, opening week 6% of business for year. Expanded since 1998 for many reasons, "sweat equity to keep customers coming back."

– Return to old curve would be horrible step backwards for business and fisheries. Under current Rule Curve can start business earlier in year and its attractive to people, guaranteed good water. Pre-2000 couldn't secure in January because people didn't know whether could boat in May., We've added 15% of total season's boat rentals by adding 25-30% to days in the season. Also have better spawning conditions. Business May into June is stronger, adding 6 or maybe 7 weeks.

– Without new rule curve, you could not navigate the Loon River. If it were changed back, the business would be shut down, economy would be devastated.

– High water is difficult for older customers – ease of access issues. Need to weigh down docks. Prolonged beating of shoreline will cost business in the future

– Have lost guests, difficult to quantify, creates extra work, loses business for landing. Negative, lost business for landing and launching.

– Traffic on lake seems down. Selling less bait and licenses to Canadian visitors. Nothing specific. Didn't lose business from guests, but inconvenient. Varies every year – data would make it difficult to determine. Same people coming and opener is consistent.

–   No business was possible in May under old rule curves, can adjust and operate on Ash River with high water. Sales have gotten better May to mid-June, always did business in bad conditions but much harder.

–   Our economics depends on fishing and wildlife, fishing big part of industry, "The Fish Rule" (Walleye), some bird watchers and those relaxing, it's about the fish.

–   Customers used to call in April "can we put our boats at docks." The 2000 curves give every resorter the opportunity to be open for business and provide lake and dock access for customers. Older fishermen were hard to keep coming.

–   Park largest water-based park in national system, largest employer on lake, can pay employees for longer season at opener, change in curves improved self-confidence (and lake association) of community no longer being bullied, tourism is industry here, voice actually got heard this time. Negative pre-2000, no water in harbor or outside it come fishing opener, 3rd or 4th generation fishermen usually couldn't come or dock boys used waders to drag boats through mud, usually lost first 2 weeks of season. Can't underscore how happy we are rules got changed and hope they stay this way.

–   High more critical for business, impact because not safe if dock is underwater; low can get planks. Media a problem.

–   (This year) virtually no lake traffic until mid-July, customers leasing dock spaces (cabin owners) kicked out for safety and no dock space so couldn't stay at cabin, cabin owners couldn't get to cabins – lost their docks.

–   Starting in 2000 every other year has been high. Low water as well but it is tolerable, high water is the problem. It has cast a bad light on all of the resorts up here, inconsistencies in water levels have harmed repeat customers, it can be very demoralizing, inspiration and hope are hard to find, not just 2014 but almost every year.

–   People used to wait to travel up river, now have longer season. Added 2-3 weeks to business in spring, charge for parking and haul parties to BWCA and Quetico. All gained by Loon River being navigable.

–   Low water was 10 fold the problem in past than high water this year, couldn't set floating docks with low water, every year spring was problem pre-2000. Much better curve, into June 2nd week couldn't launch boats off trailers. Old curve would be horrible step backwards for business and fisheries.

–   Low is potential future negative? People now much more in tune to extremes because of web information, "It kills us." Strongly believe that radical fluctuations (mostly low ends, but either) would hurt more now than it did pre-2000 due to information age.

Environmental Conditions

– Water is clear, getting better

– Improved water levels, don't want it drained, drained spawning areas

– Walleye and the fall drawdown coincides with levels targeted in spring, fall shores washed so clean spawning areas in spring at same level, also higher spring levels make for better northern pike spawning habitat, old curves left these areas dry. Seeing loon chicks in bays now. Because of the park, our visits are wildlife related. Now seeing river otters in park and population increase due to 2000 Rule Curves. Spring hard core fishing transitions to families after school is out and sight-seeing and wildlife important to experience, seeing more large groups coming here that are too big for BWCA max.

– Bought because on border of VNP it's a mecca for wildlife, northern and walleye were sketchy, National Park should be managed as natural ecosystem and natural fluctuations. Loon population has flip-flopped, rising water used to kill loon chicks, had very low loon productivity rate, from 36% success to 36% failure, guests constantly amazed when see loon chick on adults back. Wildlife habitat, more natural fluctuations of lake, never had water in harbor for fishing opener. Old rules were negative and became positive, behave closer to the way the lake was before dammed up.

– No waterfowl are left in bays, eagles take them with no vegetation, down 80%.

Fishing Conditions

– more factors, less commercial fishing, lots of big fish, hard to get in slot, expand it on high end more from 17 to 19 max is now 17."

– There are a whole bunch of other things that changed at one time, limits slot sizes, making fishing better than 15 years ago. Should change to allow 1 fish if outside slot

– Walleye is king. Don't have that many people who fish northern. Slot limits have made fishing better.

– Better fishing because curve brings the most people up. Change in angling culture. More weeks early are fishable, first few weeks in May just have fewer fishermen, the hardcore are still coming up.

– Other species habitat also important – smallmouth, musky.

Navigation and Access Conditions

– Islands and topography make more of recreational expense when water is low on Kab, such as low levels hitting rocks. This year rocks usually visible are invisible, also debris average 2/week

for propeller damage to electric and gas trolling motors – more damage to rental and private boats when high.

– Now much better than old curve, before 2000 always questionable; high and low both can worsen hazards for boating. Reefs normally visible not seen this year in high water and some submerged rocks marked this year, unmarked hazards are worse in low water.

– With low water pre-2000 you couldn't land boats bigger than 16 feet, would especially be a problem now given trends to bigger boats. Parked boat trailers on dry lake bed and people rolled logs to drag boats up.

– With lows pre-2000 would launch boats with 4 wheeler.

– Pre-2000 half the years no water behind the docks, shoreline side or protected side of dock, launch at visitors center still accessible pre-2000, interior lakes of park couldn't get to docks so not as accessible, some years water's edge 50 yards from docks.

– Low was negative pre-2000, Loon River to Lac LaCroix couldn't get up there May into June. Navigable now in May.

– Docks are under water or washed away. Ramps to docks are torn out of the banks. There is debris floating everywhere on the lake making for hazardous travel – also small to very large bogs floating around and blocking shore lines, cabins, docks, etc. as well as damage to same.

General or Multiple Conditions

– Mostly low water brings negatives (more related to inflow/outflow in Namakan), some with high water (mother nature: rainfall and snowfall), better spring water levels for fish spawning

– Normal years no cancellations, 2014 is an extreme. Consistent fishing matters most. Can't count 2014.

– Can't do anything about the weather.

– Low can be dealt with but high cannot, not necessary to alter for spawning, it hurts recreation. 2014 was a horrible year for boats. Do not agree that increased spawn is due to 2000 RC.

Suggestions

– May need more flexibility at beginning of year to not float ice, climate change likely to produce more rainfall than in the past, anticipate more large rain events – last thing we want is water to come up before ice out, damage if water comes up to float the ice.

– When water is low and you can't use docks, the material cost is slim compared to high water. Pre-2000 repeat business may have been impacted, happy medium needs to be met, Rainy has

bigger drainage area. May need to dump generator at Rainy. Can't (over)emphasize the importance of proper management, preparation to dump water is key.

– Hope they leave it as is. It has worked much better than previous curves. If it isn't broke, don't fix it.

– Hurts dock purpose when customers have to pull boats – low can't float – in high water dock flooded, "Watch the weather more, not a date."

– Pretty satisfied with the way water levels have been going except mother nature this year.

– Need water as habitat for bait fish, ladder on outside of dock to get to boats – engineering can avoid problems with high water but no easy solution for low water, people have short memories. People controlling levels should measure moisture content of snow pack in watershed in March, if lots of run-off potential they should target the bottom of the curve. Now curve is right just need to target top or bottom in advance if expecting little or lots of snowmelt or rain in watershed.

– Like it a lot better now, older lower curves had more lows and highs, should be allowed to go outside to prepare for forthcoming extremes due to high moisture content in snow. This year should have been under to anticipate snow melt. Like to build docks in winter time (Jan Feb March) and higher water makes it more difficult which is a negative of 2000 rule curves but positive 2000 overall.

– We've seen more flow, trying to move more water and not moving it efficiently, June 1 drawdown on Namakan creating problems on Rainy under 2000 curves, 7 high water events, flooded wild rice, no waterfowl.

– Restrictions in Ranier limit options, need for head pond to build up at Kooch Dam, Border Lakes Assn and resolution from Kooch Co.

– There should be a buffer that will alert those controlling about an emergency. Alterations need to be made on control structures. More attention needs to be made within the curve. Minor adjustments should be made in preparation of high water levels. More prep needs to be done on the resort end before a high water occurrence.

– In the future they could target top half of curve in August and September so Loon River isn't so low. Happy medium idea: Target water level somewhere in middle in spring. Revise to drop of 2.5 meters because 2 meter drawdown seems like too much water remains.

– Off-site control problems, lack of preparedness. Slow response to large rain events. Since 2000 every second year on average the lake gets high enough to cause damage. – Lack of communication between IJC and locals of district regarding conditions.

CUSTOMERS

Business Conditions

– Have not changed number of days, but would leave Crane Lake if they returned to the old curve.

– In 2014 we spent three weeks less compared to normal year due to lack of access and inconvenience. This is a slight reduction over other high water years.

–   I feel due to the impact the curve has had on Lake Kabetogama the fishing and wildlife habitat has improved. It's great to know that in the spring you will be able to use your docks and boat ramps. With the curve and the slot limits, I believe the fishing has improved greatly. This impact on Lake Kabetogama was a big factor for me to decide to purchase a cabin on Lake Kabetogama in 2012.

Environmental Conditions

– There are now less algae blooms.

– Duck hunting isn't what it used to be. Have the high water years hurt habitat?

Fishing Conditions

– Not walleye, smallmouth fishery. Better mostly for smallmouth, regulations have improved things. Water level and clarity have boomed the smallmouth fishing, positive to be getting 4 & 5 lb. bass.

– Slot limits force throwing back fish in slot but hard to catch fish under slot. Should change rules so can keep one of any size.

– Most people come up here for walleye. I agree that water levels have made fishing better but other mitigating circumstances are slot sizes so we're putting back the spawners. Should work on slot with bottom limit so can't keep any under 13 inches.

– Should move slot maximum up one inch from 17 to 18 inches.

Navigation and Access Conditions

– God does some of it. Levels have not been an issue but in late 80s they were too low. Harder to navigate when higher if can't see landmarks, swings in levels either way make it hard to navigate. Changes since 2000 have been favorable because we have not had major fluctuations.

– When water is low rocks are an issue, sub-surface hazards at high and low levels. In high and low water docks are difficult to use for elderly or those with mobility issues.

– In high water, there's lake debris because of floods and at times couldn't use certain ramps. But high is better than low.

– It is positive to have high enough water to have access to docks. It is nice to be able to access docks and not have to drag boat through the mud as we did in 1980s and 90s.

– Water levels have been consistent most years, low water makes it tough on the elderly.

– Strongly agree goals have been met because there is major positive impact on access early in the season. This has added to the season being old curves had no access in spring, sometimes until early July.

– Disagree that goals have been met in late July and August. Disagree because for kayaking, low water makes it difficult. Low water causes problems with boat launches and King Williams Narrows. No problems pre-2000. Post 2000 there have been many years when it's low in late summer.

General or Multiple Conditions

– In 2000 I agreed with the goals and need for higher water in spring. But have concern about flooding wild rice so otherwise would strongly agree that goals have been met. My view is that the 2014 flood was not caused by the rule curves. Overall low water is inconvenient but high water can be a total disaster. Seasonal owners stayed home so there has been lots of tourism impact lost.

– Strongly agree that water levels have improved things: fishing is better, the spawn is better and goal of ease of access has been met.

– Fishing is better now, I keep a log and recent trip was the best ever. I keep a record and am seeing more beavers, otters, ducks and loons: due to better habitat.

Suggestions

– They seem to be holding back more water. They want money's worth out of the water. Are they targeting the high end of the curve so they go above when it rains? Fishing needs more consistent water levels. In springtime should look at snow in the bush.

– Policy on water levels is a matter of give and take. I don't like to blame rule curves for high water this year, it's Mother Nature. Manage water with common sense and target low or high parts of rule curves depending on conditions.

– More spring rain since 2000. Generally speaking the rule curves are a fantastic change for visitors and resorts on the Namakan Reservoir. Should delay drawdown until later in the fall. Now late Sept. can be too shallow at the dock. After summer peak cut the rate of drawdown in half, then reduce level after mid-October, target top of curve in October.