


Rainy and Namakan Lakes Rule Curve Review

PRELIMINARY WEIGHT OF EVIDENCE MATRIX



Preliminary Weight of Evidence (WOE) Analysis

- WOE Analysis determines whether the state of a given study subject is better, neutral (no change), or worse as a result of the adoption of the 2000 Rule Curves.
 - WOE Matrix is populated using the information collected from a number of scientific, peer-reviewed studies.
 - The preliminary WOE matrix provides the Study Board's initial screening of these studies to assess the effects of the 2000 Rule Curves on Rainy and Namakan Lakes, as well as the Rainy River.
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How to read the WOE matrix

Preliminary Weight of Evidence Matrix - July 2016

Question Addressed: Did regulation of Rainy Lake and Namakan Lake under the 2000 Rule Curves result in a better, neutral, or worse outcome for the study subject?

INDEX Nos	Weight of Evidence Study Subject	Namakan Reservoir				Rainy Lake				Rainy River			
		Better	Neutral	Worse	Inconclusive	Better	Neutral	Worse	Inconclusive	Better	Neutral	Worse	Inconclusive
	1. Fish												
33	Northern Pike Population	Awaiting Study Results											
8	Northern Pike Nursery Habitat, Spawning Success	X				X							
32	Walleye Young of Year				X				X				
16, 19, 21	Walleye Spawning Habitat	X					X				X		
9, 40, 48, 49	Lake Sturgeon Population				X				X	X			
9, 19	Lake Sturgeon Spawning Habitat									Either neutral or better			
46a-d	Whitefish Population								X				
15	Rainy River Index of Biotic Integrity										X		
26, 30	Mercury Availability				X				X				
	2. Wildlife												
34	Beaver Population	Awaiting Study Results											
6	Habitat for birds and herptiles				X				X				
4, 21, 31	Common Loon Reproductive Success	X					X						
21	Muskrats		X			X							
	3. Economic Impacts												
*	Power Production							X					
11	Flooding			X				X					
11	Ice Damage				X				X				
10	Resort Industry	X							X				
	4. Cultural Resources												
12,13	Condition of Resources	X				X							X
	5. Vegetation												
21	Cattail Invasion		X					X					
1,28	Wetland vegetation	X							X				
21	Shrubby Swamps	X					X						
21	Emergent Vegetation - Wet meadow	X				X							
21	Emergent Vegetation - Shrubby Swamp	X					X						
21	Submerged Plants		X				X						
21	Wild rice		X				X						

Study subjects are grouped by category for clarity purposes. The categories and study subjects are listed in no particular order.

How to read the WOE matrix

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		Better	Neutral	Worse	Inconclusive	Better	Neutral	Worse	Inconclusive	Better	Neutral	Worse	Inconclusive		
		1. Fish													
33	Northern Pike Population	Awaiting Study Results													
8	Northern Pike Nursery Habitat, Spawning Success	X				X									
32	Walleye Young of Year				X				X						
16, 19, 21	Walleye Spawning Habitat	X					X				X				
9, 40, 48, 49	Lake Sturgeon Population				X				X		X				
9, 19	Lake Sturgeon Spawning Habitat	Either neutral or better													
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26, 30	Mercury Availability				X				X						
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34	Beaver Population	Awaiting Study Results													
6	Habitat for birds and herptiles				X				X						
4, 21, 31	Common Loon Reproductive Success	X					X			X					
21	Muskrats		X			X									
		3. Economic Impacts													
*	Power Production														
11	Flooding			X				X							
11	Ice Damage				X				X						
10	Resort Industry	X							X						
		4. Cultural Resources													
12,13	Condition of Resources	X				X							X		
		5. Vegetation													
21	Cattail Invasion		X					X							
1,28	Wetland vegetation	X							X						
21	Shrubby Swamps	X					X								
21	Emergent Vegetation - Wet meadow	X				X									
21	Emergent Vegetation - Shrubby Swamp	X					X								
21	Submerged Plants		X				X								

The Index Number column refers to the study from which the analysis results were pulled. Please refer to the index provided.

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		Better	Neutral	Worse	Inconclusive	Better	Neutral	Worse	Inconclusive	Better	Neutral	Worse	Inconclusive
33	Northern Pike Population	Awaiting Study Results											
8	Northern Pike Nursery Habitat, Spawning Success	X				X							
32	Walleye Young of Year				X				X				
16, 19, 21	Walleye Spawning Habitat	X					X				X		
9, 40, 48, 49	Lake Sturgeon Population				X				X	X			
9													
46													
26													
4, 2													
1													
1													
21	Emergent Vegetation - Strubby Swamp	X				X				X			
21	Submerged Plants		X				X						
21													

Inconclusive Results

Results of a particular study may be deemed inconclusive if the Study Board feels that any change in status of a particular study subject cannot be attributed to the 2000 Rule Curves.

The Board has reviewed all available studies to determine whether for conditions for the subject in a particular water body are **better, neutral or worse**. In some cases, study results were **inconclusive**.


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1. Fish		Awaiting Study Results											
33	Northern Pike Population	Awaiting Study Results											
8	Northern Pike Nursery Habitat, Spawning Success	X				X							
32	Walleye Young of Year				X				X				
16, 19, 21	Walleye Spawning Habitat	X					X				X		
9, 40, 48, 49	Lake Sturgeon Population				X					X			
9, 19	Lake Sturgeon Spawning Habitat	Either neutral or better											
46a-d	Whitefish Population	Awaiting Study Results											
15	Rainy River Index of Biotic Integrity	Awaiting Study Results											
26, 30	Mercury Availability				X					X			
2. Wildlife		Awaiting Study Results											
34	Beaver Population	Awaiting Study Results											
6	Habitat for birds and herptiles				X					X			
4, 21, 31	Common Loon Reproductive Success	X					X						
21	Muskrats		X			X							
3. Economic Impacts		Awaiting Study Results											
*	Power Production	Awaiting Study Results											
11	Flooding			X					X				
11	Ice Damage				X					X			
10	Resort Industry	X								X			
4. Cultural Resources		Awaiting Study Results											
12,13	Condition of Resources	X				X							X
5. Vegetation		Awaiting Study Results											
21	Cattail Invasion		X					X					
1,28	Wetland vegetation	X							X				
21	Shrubby Swamps	X					X						
21	Emergent Vegetation - Wet meadow	X				X							
21	Emergent Vegetation - Shrubby Swamp	X					X						
21	Submerged Plants		X				X						

Some matrix cells have been greyed out because:

- 1) the study subject is not applicable for a given water body, or
- 2) no study or information is available to make an assessment.

Important notes

- The WOE matrix does not indicate the degree to which conditions improved or worsened.
 - In some cases, studies are unable to separate confounding factors (such as hydrology) that may have influenced the outcome.
 - Assessment of hydropower impacts provided by Companies, based on internal study by contractor.
 - Certain study subjects can be further evaluated using Shared Vision Modelling.
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Questions for You

What are your initial impressions on the Weight of Evidence Matrix?

Looking at the 2000 Rule Curves, what possible changes in targets would you like to see examined by the Study Board and why?

Are there ways that you think the IJC could improve regulation of the lake levels besides changing targets?