

Population analysis of harvested fish species in the Travaillant Lake system 2007

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Introduction

The proposed Mackenzie Valley pipeline is expected to pass directly through the Travaillant Lake system, and within 10 km of Travaillant Lake itself. Pipeline construction can result in complicated and often long term effects on the aquatic environment, particularly for fish. Travaillant Lake was identified as an area of special concern because of its proximity to the proposed Mackenzie Valley pipeline, its cultural and ecological importance to the Gwich'in, and the lack of baseline information on its fish resources.

Due its importance and lack of baseline information, a study to provide information on vital rates and abundance of fish stocks in Travaillant Lake was undertaken. The following objectives were set out to provide this information:

- 1) Determine baseline population status and develop indicators of population abundance of key harvested fish species (lake whitefish and broad whitefish) in the Travaillant Lake system.
- 2) Identify and determine relative abundance and species composition of other species within the lake system.



Trevor Storr recording data



Brian Dokum checking nets

Methods

Three areas on the Travaillant Lake system were sampled, one each on the north river, main lake, and south river. From June 11th to 21st a field crew from the Gwich'in Renewable Resource Board (GRRB) sampled the main lake site, and from October 18th to 28th the two river sites were sampled by field crews consisting of one Department of Fisheries and Oceans representative, two GRRB representatives, and one youth.

The field crew set gill nets of various mesh sizes in order to catch a wide range of sizes and ages of fish. All captured fish caught were sampled for length, weight, sex,

maturity, gonad (reproductive organs) weight, ageing structures, muscle tissue, and fin tissue. If the fish was a mature female, the gonads were collected and frozen. If the fish appeared to have food in their stomachs, the stomach and intestines were collected and frozen. Some fish which were too small to be positively identified were frozen whole and will be processed in the lab soon.



Nathan Millar (left) and Trevor Storr (right) sampling fish in tent

Results

A total of 832 fish were caught at three sampling sites during this study. 349 broad whitefish (BDWT, 72 lake, 61 south river, 216 north river), 298 lake whitefish (LKWT, 80 lake, 211 south river, 7 north river), 90 lake cisco (cisco, 77 lake, 13 south river), were caught in multi-mesh gill nets (Figure 1). There were also 16 northern pike (NRPK) caught in the lake as well as one Grayling caught in the south river (Figure 1).



Sampling table

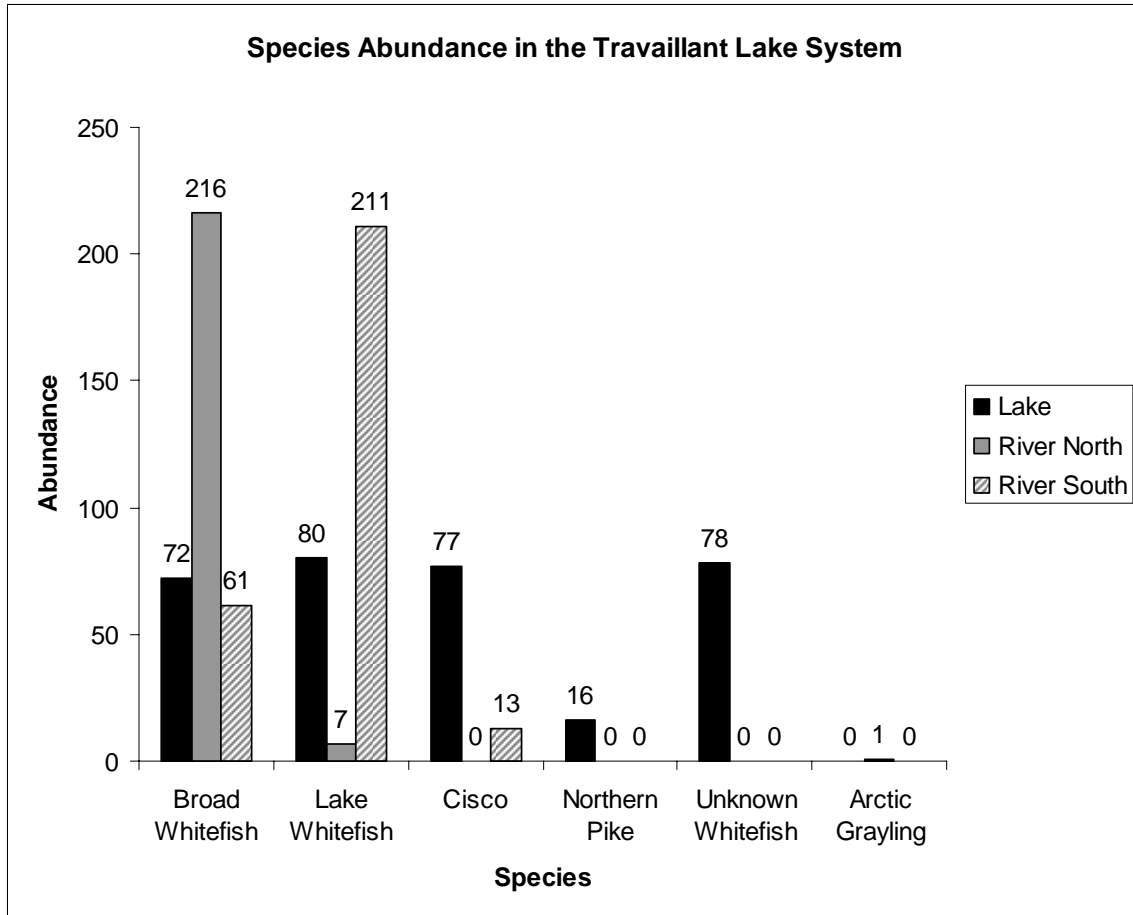


Figure 1. Species composition and frequency in the Travaillant Lake system

The longest broad whitefish was 21.2 inches (river south), and the longest lake whitefish was 21.5 inches (lake) (Table 1.). The diversity of species increased when fishing in the main lake opposed to either river. The largest northern pike was 37.56 inches, and 12.68 pounds. The largest lake trout was 44.3 inches, and 22.4 pounds. The average size of Cisco was 6.3 inches, and 0.1 pounds, with the largest being 13.2 inches and 0.9 pounds (Table 3.).



Lake Whitefish (top) Broad Whitefish (bottom)

Table 1. Maximum, minimum, and average lengths of Whitefish, and Crooked Back in Travaillant Lake system

	Travaillant River South			
	Broad Whitefish		Lake Whitefish	
	(mm)	(in)	(mm)	(in)
Min of Fork Length	199.0	7.8	188.0	7.4
Max of Fork Length	539.0	21.2	515.0	20.3
Average of Fork Length	434.6	17.1	308.0	12.1

	Travaillant River North			
	Broad Whitefish		Lake Whitefish	
	(mm)	(in)	(mm)	(in)
Min of Fork Length	364.0	14.3	203.0	8.0
Max of Fork Length	523.0	20.6	444.0	17.5
Average of Fork Length	435.9	17.2	388.3	15.3

	Travaillant Lake			
	Broad Whitefish		Lake Whitefish	
	(mm)	(in)	(mm)	(in)
Min of Fork Length	225.0	8.9	215.0	8.5
Max of Fork Length	505.0	19.9	545.0	21.5
Average of Fork Length	357.0	14.1	385.1	15.2

Table 2. Maximum, minimum, and average weights of Whitefish, and Crooked Back in Travaillant Lake system

	Travaillant River South			
	Broad Whitefish		Lake Whitefish	
	(g)	(lbs)	(g)	(lbs)
Min of Weight	90.0	0.2	67.0	0.1
Max of Weight	2738.0	6.0	2089.0	4.6
Average of Weight	1348.6	3.0	492.7	1.1

	Travaillant River North			
	Broad Whitefish		Lake Whitefish	
	(g)	(lbs)	(g)	(lbs)
Min of Weight	716.0	1.6	110.0	0.2
Max of Weight	2308.0	5.1	1284.0	2.8
Average of Weight	1178.7	2.6	936.3	2.1

	Travaillant Lake			
	Broad Whitefish		Lake Whitefish	
	(g)	(lbs)	(g)	(lbs)
Min of Weight	212.0	0.5	124.0	0.3
Max of Weight	1869.0	4.1	2018.0	4.4
Average of Weight	644.4	1.4	841.1	1.9

Table 3. Maximum, minimum, and average lengths and weights of Lake Cisco and Northern Pike in the Travaillant Lake system

	Travaillant Lake			
	Lake Cisco		Northern Pike	
	(mm)	(in)	(mm)	(in)
Min of Fork Length	114.0	4.5	126.0	5.0
Max of Fork Length	335.0	13.2	1125.0	44.3
Average of Fork Length	158.9	6.3	726.1	28.6

	Travaillant Lake			
	Lake Cisco		Northern Pike	
	(g)	(lbs)	(g)	(lbs)
Min of Weight	14.0	0.0	15.0	0.0
Max of Weight	417.0	0.9	10150.0	22.4
Average of Weight	52.5	0.1	3476.6	7.7

Further work

Completion of the sampling process will occur in the winter 07/08. During this time the structures that were removed in the field will be analysed in the lab to determine age and fecundity (number of eggs per mature female) where applicable. Additional statistical analysis will be performed after the lab work is complete. The remaining structures taken from fish in the field will be stored for potential analyses in the future.



Acknowledgements

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