Executive Summary Mount Milligan 2004

Mt. Milligan Lake is a shallow and productive, 24 ha, marl bottomed lake situated 110 km southwest of Mackenzie. A stocking assessment was conducted at Mt. Milligan Lake between June 28-29, 2004; this was the first assessment completed on this lake. The objective of this assessment was to document the status of the fishery in response to concerns from local anglers that the quality of this wild rainbow trout fishery had declined. Special angling restrictions were imposed starting April 1, 2004 as a temporary measure to protect the fishery until a stock assessment could be completed in summer 2004.

Two floating and one sinking (standard experimental mesh) gillnets 90 m in length were deployed. Short duration sets were used to minimize impact to the fishery. The total gill-net sampling effort was 5.53 hours, resulting in a high catch per unit effort (CPUE) of 7.23 fish per hour. At this time the rainbow trout population is providing for an average angling experience with an average size of 34 cm for fish vulnerable to the fishery (i.e. fish> 250 mm). Only 30% of the gillnet catch consisted of fish larger than 250 mm, indicating either variable recruitment or a high fishing mortality rate. The largest fish in the gill net catch was 485 mm and 1100 grams and was five years old. Only 6 fish greater than age-3 that were also longer than 35 cm were caught, which assuming relatively constant recruitment suggests that large mature fish in this fishery may have be depleted by excess angling pressure. Based on relatively high growth rates of 49-113 mm per year, and a high net catch rate of over 7 fish per hour, it is unlikely that an unrestricted sports fishery will collapse this population. However, based on local anecdotal information from anglers that catches of larger sized fish were previously common and considering the unique character of this wild fishery, it is recommended that Mt. Milligan Lake should be managed as a catch and release fishery.

Figure 1. West end of Mount Milligan Lake. Inset: 40 cm. rainbow trout caught on a dry fly..

OMINECA REGION
LAKE STOCK ASSESSMENT REPORT

LAKE NAME: 0 ***ALIAS:*** Mount Milligan ***BC WBID:*** 01479NATR

LAKE LOCATION: *Nearest center:* 110 km SW of Mackenzie *Drainage:* Nation
UTM: 10.432069.5713.6108907.915

LAKE ATTRIBUTES:

Surface Area:	24.3 Ha	*Elevation:*	1070 m
Littoral Area:	n/a Ha	*T.D.S.:*	n/a ppm
Max Depth:	7 m	*Mean depth:*	n/a m

MANAGEMENT OBJECTIVE (mean length in gillnet (cm)):

Objective 1	Family Fishery (High CPUE <30 cm)	☐
Objective 2	Average Quality (30-40 cm)	☐
Objective 3	Above Average (40-50 cm)	☒
Objective 4	Trophy (20% > 50 cm for RB, 20% > 40 cm for EB)	☐

MANAGEMENT/SURVEY HISTORY :

Previous gill net assessment(s): no ☒ yes ☐
Year(s) Surveyed: n/a

STOCKING DATA:

Current Stocking Rate	**Not stocked** Fish/Ha	
Stock Type	**Wild**	
Species	RB, mixed	Cyprinids present- likely lake chubb, none were captured
Previous Stocking Rate	n/a	

SURVEY METHODS:

Method		Date (yy.mm.dd)	Survey Agency	Crew
Fish	SGN	2004-06-28	Ministry of Environment	Cory Williamson, Ray Pillipow
Chem.	Cond.	2004-06-28		
Physical		2004-06-28		
Temp.	Temp Profil	2004-06-28		

Netting Specs: *Net type:* Standard Experimental *Net length:* 90m (3x30m)
Setting: Sinking or Floating *Panel Mesh:* Standard

SURVEY RESULTS:

Catch

	RB	EB	RSC	LKC	LSU	CSU	NSC	CAS	BT	LT
2004	40	0	0	0	0	0	0	0	0	0
-	0	0	0	0	0	0	0	0	0	0
-	0	0	0	0	0	0	0	0	0	0
-	0	0	0	0	0	0	0	0	0	0

Survey Year	**2004**	-	-	-	
Effort Hours	5.53				
RB CPUE:	7.23				RB/Net Hour
EB CPUE:	0.00				EB/Net Hour
# of Sets:	3				

Next Assessment **2010**

SURVEY CONCLUSIONS:

Objective	Objectives Achieved Yes	No	Reason
1. Family	☐	☐	
2. Average	☐	☐	
3. Above Average	☐	☐	
4. Trophy	☐	☐	

RECOMMENDATIONS:

Assessment: 40 rainbow trout were captured with 5.5 hours of gill net effort. This lakes appears to be supporting reasonably high levels of naturally recruiting rainbow trout with good growth rates. However only 6 fish (35-48 cm) older than 3 year old were caught in the gill net catch. Reassess in 4-years or four years after any new regulations.

Management: With some restrictions, possibly including a full catch and release regulation this lake could be managed as an above average quality fishery, or possibly a trophy fishery. Considering the unique nature of this wild lake, and the availability of catch and keep stocked lake fisheries near Mackenzie, it is recommended that this lake be designated a catch and release fishery in consultation with the local community to maintain above average angling quality.

Comments: Anglers have expressed strong concern that the lake has been receiving an unsustainable levels of angling effort and that the quality of the fishery had declined substantially. Anecdotal reports indicated that fish of 5-6 pounds may have been common and that it is now rare to catch a fish reaching 3 lbs. Only 6 fish near spawning age (3-5) were captured in the gillnets, indicating that there has likely been some level of depletion. Instantaneous growth rates for fish caught in this survey ranged from 49 to 113 mm per year between ages 1 and 5, and are indicative of good growth. Maximum size in the catch was 485 mm and 1100 grams.

Uncertainties: Level of natural recruitment is likely to be variable due to the presence beaver dams and culverts on the lake upstream of the outlet.

Recent Brood Request Comments:

Not Applicable: Wild Fishery

History of Angling Regulations

In response to local concerns regarding the state of the mount Milligan Lake fish population, conservative angling restrictions were put in place starting April 1, 2004 to protect these fish until such time as a stock assessment could be completed. Standard regional quality fishery regulations were put in place including: winter closure Nov. 1- Apr. 30. ; bait ban, single barbless hook; daily quota of three rainbow trout none of which may be over 40 cm.

Reported by: Cory Williamson
Date: Jun-05

Table 1. Rainbow trout physical attributes by age:

			Length (mm)				Weight (g)				Condition (k)				
Sample Year	Age	Sample Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Var
2004	1	8	114	98	133	12.9	19	13	28	6.1	1.23	1.12	1.49	0.1	0.01
2004	2	11	212	190	246	20.7	124	86	200	36.4	1.27	1.15	1.34	0.1	0.00
2004	3	14	260	216	310	26.2	238	124	410	77.1	1.31	1.05	1.41	0.1	0.01
2004	4	3	391	351	412	34.7	627	540	760	117.2	1.07	0.78	1.34	0.3	0.08
2004	5	3	440	379	485	54.6	957	660	1110	257.0	1.12	0.96	1.21	0.1	0.02

Table 2. Catch summary for all sample years.

		Length (mm)				Weight (g)				Condition (k)				
Sample Year	Sample Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Var
2004	40	244	98	485	98.3	257	13	1110	275.7	1.25	0.78	1.49	0.13	0.02

Table 3. Proportion of Catch (by survey year)

Survey Year	2004	
Less than 250 mm	60.0	%
Between 250-350 mm	22.5	%
Between 250-400 mm	30.0	%
Greater than 400 mm	10.0	%
Greater than 500 mm	0.0	%

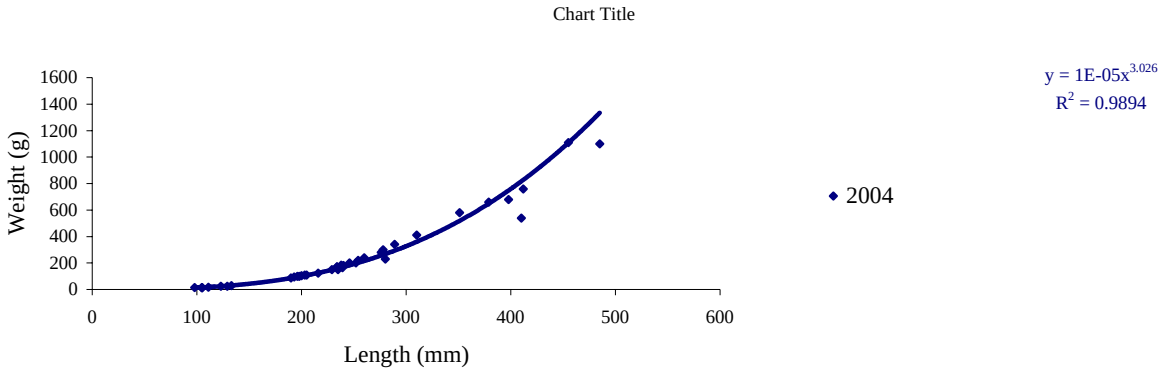
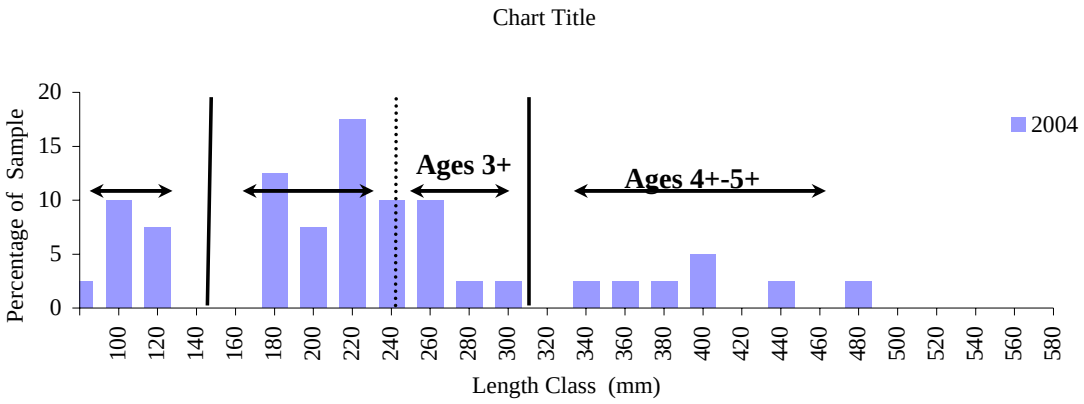


Figure 2. Length weight power relationship.



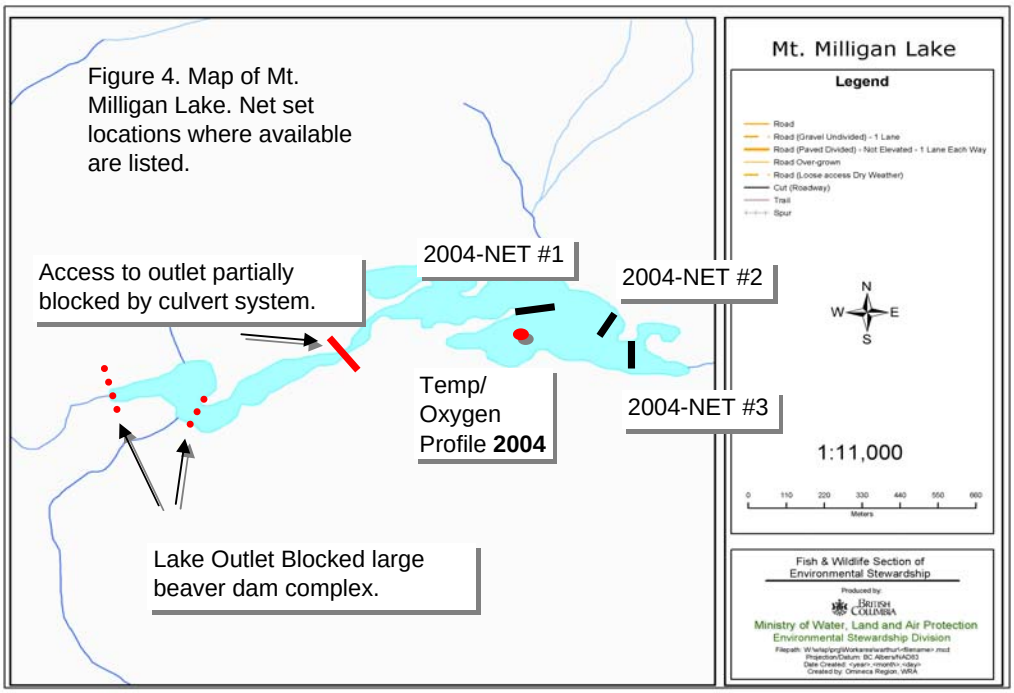


Table 5. Dissolved Oxygen/ Temperature Profile

28-Jun-04 Station UTM **10.431778.6108879**

Depth (m)	DO mg/L	DO %sat	Temp. ^{0}C	pH	Cond (25^{o}C)
0	n/a	n/a	18.61	n/a	205
1	n/a	n/a	18.47	n/a	205
2	n/a	n/a	18.41	n/a	203
3	n/a	n/a	18.3	n/a	203
4	n/a	n/a	17.91	n/a	206
5	n/a	n/a	17.06	n/a	255
6	n/a	n/a	17.03	n/a	259
7	n/a	n/a	16.98	n/a	260

Table 6. Stock Assessment Data for 2004 (see lake files for additional survey data).

Lake	Sample#	Site	Number	Species Caught	Origin	Age	Length (mm)	Weight (grams)	Condition (k)	Scale Age	Structure	Cond. Code	Clip	Sex	Maturity
Mount Milli	1	1	1	RB	w	5	455	1110	1.2	5o	o			m	mt
Mount Milli	2	1	1	RB	w	4	410	540	0.8	4*	o			m	st
Mount Milli	3	1	1	RB	w	3	278	280	1.3	3+	o			f	mt
Mount Milli	4	1	1	RB	w	3	289	340	1.4	3+	o			m	mt
Mount Milli	5	1	1	RB	w	3	254	220	1.3	3+	o			m	mt
Mount Milli	6	1	1	RB	w	3	278	300	1.4	3+	o			f	mt
Mount Milli	7	1	1	RB	w	3	276	280	1.3	3+	o			f	mt
Mount Milli	8	1	1	RB	w	2	246	200	1.3	2+	o			m	im
Mount Milli	9	1	1	RB	w	3	252	200	1.2	3+	o			f	mt
Mount Milli	10	1	1	RB	w	3	216	124	1.2	3+	o			m	im
Mount Milli	11	1	1	RB	w	2	196	98	1.3	2++	o			m	im
Mount Milli	12	1	1	RB	w	2	198	98	1.3	2++	o			m	im
Mount Milli	13	1	1	RB	w	2	229	150	1.2	2++	o			f	im
Mount Milli	14	1	1	RB	w	2	203	109	1.3	2++	o			f	im
Mount Milli	15	1	1	RB	w	2	205	108	1.3	2+	o			m	im
Mount Milli	16	1	1	RB	w	3	240	181	1.3	3+	o			m	im
Mount Milli	17	1	1	RB	w	2	190	86	1.3	2+	o			f	im
Mount Milli	18	1	1	RB	w	1	133	28	1.2	1+	o	ight assisted final age		m	im
Mount Milli	19	1	1	RB	w	1	129	25	1.2	1+	o	ight assisted final age		m	im
Mount Milli	20	1	1	RB	w	1	105	14	1.2	1+	o			m	im
Mount Milli	21	1	1	RB	w	1	111	16	1.2	1+	o			f	im
Mount Milli	22	1	1	RB	w	1	105	13	1.1	1+	o			m	im
Mount Milli	23	1	1	RB	w	1	105	14	1.2	1+	o			f	im
Mount Milli	24	2	1	RB	w	5	485	1100	1.0	5*	o			f	st
Mount Milli	25	2	1	RB	w	4	351	580	1.3	4+	o			f	mt
Mount Milli	26	2	1	RB	w	3	260	240	1.4	3+	o			m	mt
Mount Milli	27	2	1	RB	w	3	234	170	1.3	3+	o			f	im
Mount Milli	28	2	1	RB	w	2	239	164	1.2	2++	o	paque center		m	im
Mount Milli	29	2	1	RB	w	2	235	149	1.1	2++	o			f	im
Mount Milli	30	2	1	RB	w	3	280	230	1.0	3++	o			m	im
Mount Milli	31	2	1	RB	w	3	234	172	1.3	3+	o			f	mt
Mount Milli	32	2	1	RB	w	2	200	105	1.3	2++	o			f	im
Mount Milli	33	2	1	RB	w	1	123	24	1.3	1++	o			m	im
Mount Milli	34	2	1	RB	w	1	98	14	1.5	1++	o			f	im
Mount Milli	35	4		RB	w		398	680	1.1	n/a	o	e (broken and opaque)		f	bd
Mount Milli	36	3	1	RB	w	4	412	760	1.1	4*	o			f	bd
Mount Milli	37	3	1	RB	w	5	379	660	1.2	5*	o			f	bd
Mount Milli	38	3	1	RB	w	3	310	410	1.4	3+	o			f	mt
Mount Milli	39	3	1	RB	w	2	193	94	1.3	2++	o			f	im
Mount Milli	40	3	1	RB	w	3	238	184	1.4	3++	o			m	im