Executive Summary Munlo Lake 2004

A stocking assessment was conducted on Munlo Lake during the fall of 2004. The original management goal for Munlo Lake was to manage for a low to moderate use fishery for rainbow trout. The objectives of this assessment were to document the status of the fishery and to evaluate the stocking protocol for this lake. Both a standard sinking and a floating gillnet 90 m in length (standard mesh) were set on October 19, 2004. The total sampling effort was 48 hours resulting in a gillnet catch per unit effort (CPUE) of 0.71 fish per hour. The rainbow trout sampled during the 2004 assessment had a mean length of 273 mm and a maximum length of 453 mm. Munlo Lake is presently meeting the management objective for an average quality fishery, however the outlet stream from Munlo Lake appears to be directly connected to Carp Lake. Carp Lake is currently being managed as a "wild rainbow trout fishery" so rainbow trout escapes from Munlo Lake may compromise this objective. Fisheries staff will investigate Munlo Lake to make a determination of the connectivity to Carp Lake. As well, it is recommended that an angler creel/satisfaction survey be completed for Munlo Lake to determine the amount of angler effort. If it is determined that sufficient connectivity exists to Carp Lake then a request for AF3N (sterile) Blackwater strain will be made for the spring stocking event in 2007. Alternatively, if angler interest or use appears low, Munlo Lake may be removed from the stocking list in the future and managed as a wild fishery, as this lake supported a wild rainbow trout fishery prior to the inception of stocking.

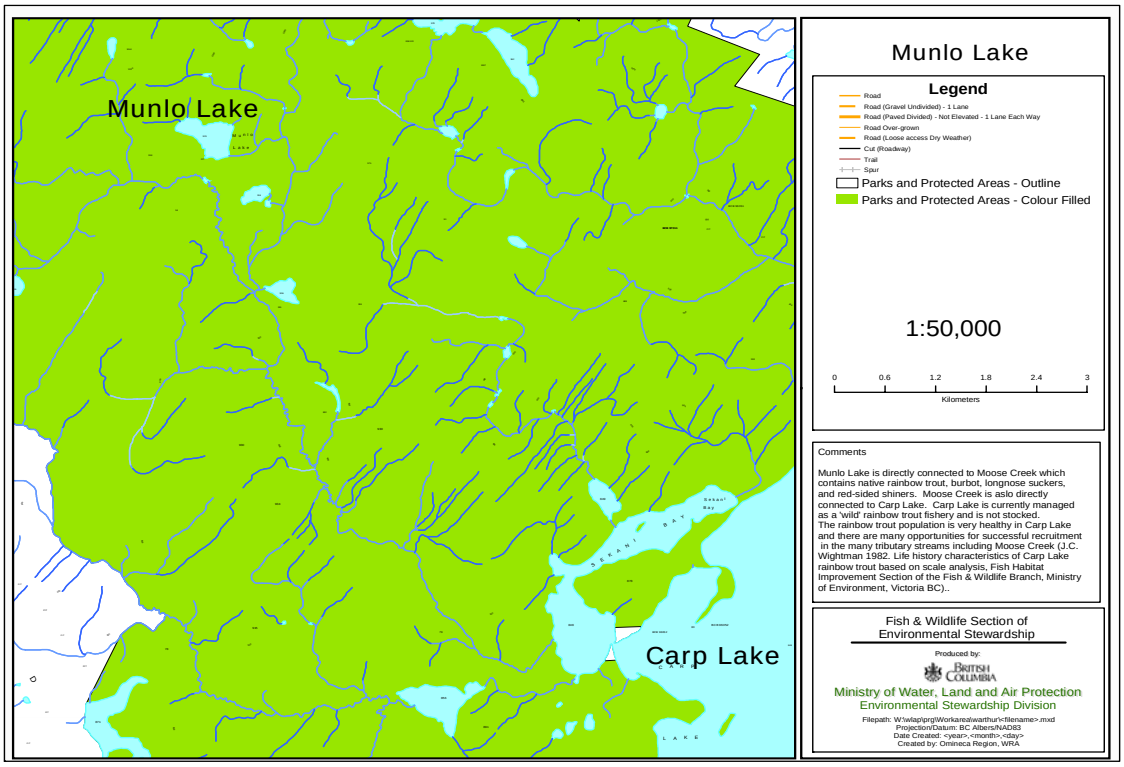

Figure 1. Map showing location of both Munlo and Carp Lakes.

OMINECA REGION
LAKE STOCK ASSESSMENT REPORT

LAKE NAME: Munlo Lake ***ALIAS:*** CARR ***BC WBID:*** 00663CARP

LAKE LOCATION: *Nearest center:* 125 km N of Prince Georg *Drainage:* FRASER
UTM: 10.468857.6076168

LAKE ATTRIBUTES:

Surface Area:	21.6 Ha	*Elevation:*	937	m
Littoral Area:	13.7 Ha	*T.D.S.:*	32	ppm
Max Depth:	13 m	*Mean depth:*	4.5	m

MANAGEMENT OBJECTIVE:

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 ☒ Little 1984
Year(s) Surveyed: 1984; 1991

STOCKING DATA:

Current Stocking Rate	69	Fish/Ha	Odd years
Stock Type	**PENNASK AF**		
Species	RB mixed		
Previous Stocking Rate	69		

SURVEY METHODS:

Method		Date (yy.mm.dd)	Survey Agency	Crew
Fish	SGN	2004-10-19	BCCF	Chad Robertson, Kevin Mernickle
Chem.	DO, pH, Cor	2004-10-19	BCCF	Chad Robertson, Kevin Mernickle
Physical	Bathymetric	1984-08-14	MOE	R. Little
Temp.	profile	2004-10-19	BCCF	Chad Robertson, Kevin Mernickle

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

SURVEY RESULTS:

Catch

	RB	EB	RSC	LKC	LSU	CSU	NSC	CAS	BT	LT
2004	34	0	0	3	0	0	0	0	0	0
1991	10	0	5	0	0	0	0	0	0	0
1984	28	0	0	0	0	0	0	0	0	0

Survey Year	**2004**	**1991**	**1984**	
Effort Hours	48	6	16	
RB CPUE:	0.71	1.67	1.75	RB/Net Hour
EB CPUE:	0.00	0.00	0.00	EB/Net Hour
# of Sets:	2	1	1	

Next Assessment **2009**

SURVEY CONCLUSIONS:

Objective	Objectives Achieved Yes	No	Reason
1. Family	☐	☐	
2. Average	☑	☐	42% of the catch is between 250-400 mm
3. Above Average	☐	☐	
4. Trophy	☐	☐	

RECOMMENDATIONS:

Assessment: The next assessment of Munlo Lake is scheduled for 2009, however Ministry staff will examine this lake in the summer of 2005 to assess fishing effort as well as the connectivity of the outlet stream to Moose Creek.

Management: Munlo Lake was assessed two years after stocking commenced. The report indicated that the outlet contained suitable spawning habitat for rainbow trout during periods of time when there is sufficient water flows. Munlo Lake is also directly connected to spawning habitat utilized by Carp Lake rainbow trout, a designated 'wild' rainbow fishery. Recommend to change from AF to AF3N in 2007.

Comments:

Uncertainties: The amount of fishing pressure at Munlo Lake is unknown. As well, there is potential for downstream migration of stocked rainbow trout into Carp Lake and it's tributaries.

Recent Brood Request Comments:

2005 Odd year stocking of 1,500; stock will change to AF3N in 2007 as AF go out of production

History of Angling Regulations

There are no special angling regulations on Munlo Lake.

Reported by: Adrian Clarke
Date: Mar-05

Table 1. Rainbow trout physical attributes for sample years:

			Length (mm)				Weight (g)				Condition (k)				
Sample Year	Age	Sample Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Var
1984	1	6	129	108	148	13.2	26	18	33	5.4	1.20	1.02	1.43	0.1	0.02
2004	2	24	233	165	280	29.6	145	48	270	56.0	1.08	0.96	1.30	0.1	0.01
1984	2	10	259	209	289	27.2	174	103	235	43.4	1.00	0.91	1.14	0.1	0.01
1984	3	12	280	256	318	17.7	236	165	350	52.0	1.06	0.92	1.17	0.1	0.00
2004	4	5	363	331	379	20.3	612	450	730	103.5	1.27	1.18	1.38	0.1	0.01
2004	5	2	396	384	408	17.0	750	690	810	84.9	1.21	1.19	1.22	0.0	0.00
2004	6	2	427	399	454	38.9	880	760	1000	169.7	1.13	1.07	1.20	0.1	0.01

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	34	273	165	454	74.3	292	48	1000	265.2	1.12	0.96	1.38	0.10	0.01
1991	10	209	107	461	74.3	227	10	1035	373.9	0.91	0.56	1.07	0.16	0.03
1984	28	240	108	318	63.2	169	18	350	91.1	1.07	0.91	1.43	0.11	0.01

Table 3. Proportion of Catch (by survey year)

Survey Year	2004	1991	1984
Less than 250 mm	52.9 %	70.0 %	35.7 %
Between 250-350 mm	23.5 %	10.0 %	64.3 %
Between 250-400 mm	41.2 %	10.0 %	64.3 %
Greater than 400 mm	5.9 %	20.0 %	0.0 %
Greater than 500 mm	0.0 %	0.0 %	0.0 %

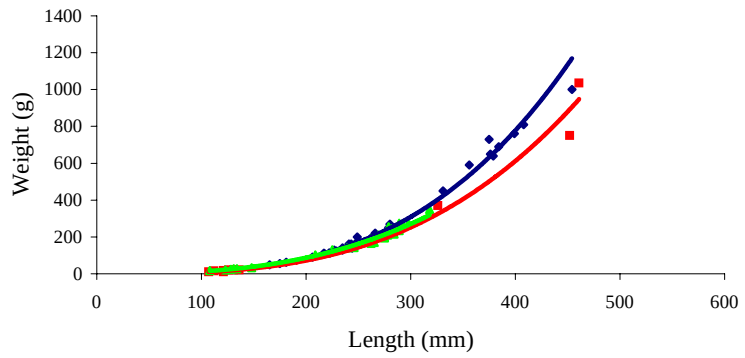

Figure 2. Length weight power relationship.

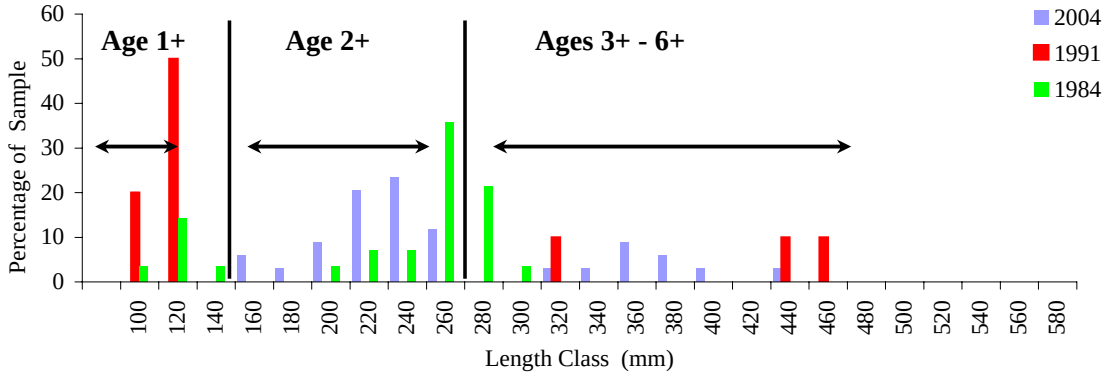

Figure 3. Length frequency distribution. Age brackets aply to 2004 data only.

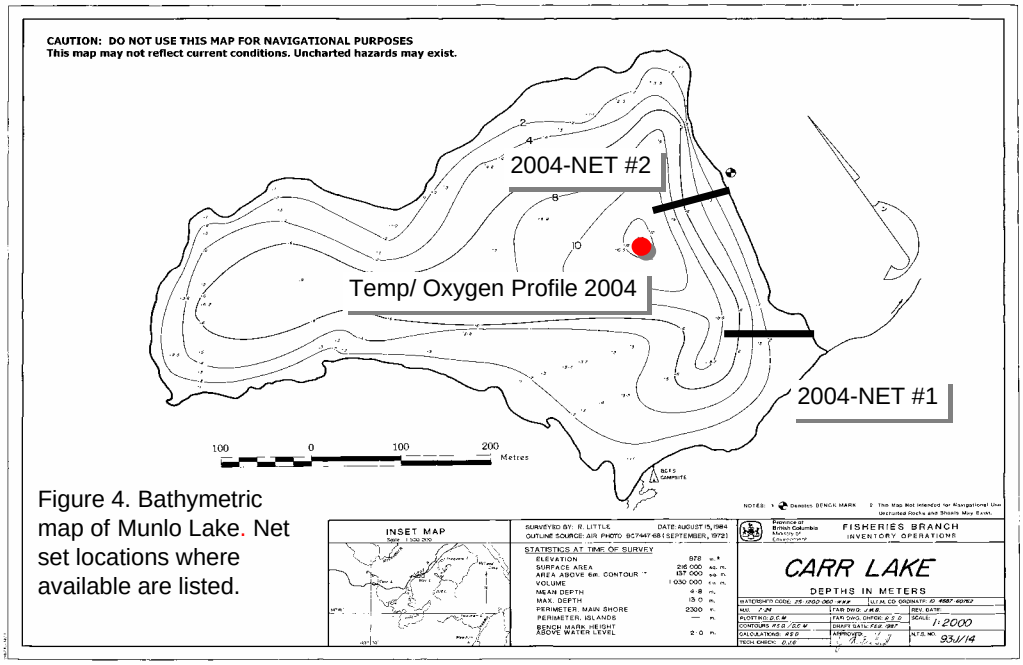

Figure 4. Bathymetric map of Munlo Lake. Net set locations where available are listed.

Table 4. Stocking History for Munlo Lake to 2004.

Release Date	Species Name	Fish Count	Stock	Mark	Average Size (gm)	Life Cycle Stage
12-Jun-03	RB	1500	PENNASK AF		5.56	YEARLING
1-Jun-01	RB	1500	PENNASK BV AF		12.72	YEARLING
3-Jun-99	RB	1500	PENNASK BEAV AF		15.15	YEARLING
28-May-97	RB	1500	PENNASK HATH AF		17.1	YEARLING
25-May-95	RB	1500	PENNASK AF		18.52	YEARLING
10-Jun-93	RB	2500	DRAGON/TUNKWA		3.7	YEARLING
10-Jun-91	RB	2500	NRT PREMIER		5.1	YEARLING
3-Jun-89	RB	2500	TUNKWA		8.4	YEARLING
1-May-87	RB	2500	TUNKWA		15.3	UNKNOWN
1-Aug-85	RB	5000	NRT PREMIER		0.8	UNKNOWN
1-Sep-83	RB	5000	DRAGON		1.9	UNKNOWN
1-Sep-82	RB	5000	NRT PREMIER		1.3	UNKNOWN

Table 4. Dissolved Oxygen/ Temperature Profile

15-Aug-84		
Depth (m)	DO	Temp. ^{0}C
0	8.1	17
1	7.9	16.8
2	8	16.8
3		15.2
4	8.3	14.5
5	7.9	9.8
6	5.9	8.8
7	1.7	6
8	0.3	5.4
9	0.18	4.9
10		
11	0.16	4.9
12		
13	0.2	4.8
14	bottom	bottom

26-Oct-04 Station UTM 10.468616.6076231					
Depth (m)	DO mg/L	DO %sat	Temp. ^{0}C	pH	Cond (25^{o}C)
0	7.09	55.7	5.07	7.0	12
1	7.3	58.4	5.18	6.9	16
2	7.16	56.8	5.18	6.6	13
3	7.11	55.8	5.21	6.3	
4	6.91	54.2	5.21	6.1	14
5	7.19	56.5	5.21	5.8	16
6	7.07	56.0	5.21	5.9	15
7	6.95	54.7	5.15	5.9	13
8	6.92	54.9	5.16	5.7	15
9	6.97	55.0	5.13	5.8	17
10	7.18	56.3	5.1	5.7	18
11					
12					
13					
14					

Table 5. Stock assessment data for 2004 (see lakes file for additional survey data).

Lake	Sample#	Site	Species Caught	Age	Length (mm)	Weight (grams)	Condition (k)	Scale Age	Structure	Sex	Maturity	Ageing Comments	Comments
Munlo	1	1	RB	6	454	1000	1.1	6+	OT	M	M	latter annuli vague	red stripes
Munlo	2	1	RB	6	399	760	1.2	6+	OT	F	M	tip broken	dark stripes
Munlo	3	1	RB		222	113	1.0		OT	F	IM	broken; unreadable	small bright fish
Munlo	4	1	RB	4	379	640	1.2	4+	OT	F	ST		
Munlo	5	1	RB	2	279	250	1.2	2++	OT	F	IM	translucent	
Munlo	6	1	RB	2	217	111	1.1	2++	OT	F	IM		
Munlo	7	1	RB	2	252	159	1.0	2++	OT	F	IM	translucent	
Munlo	8	1	RB	2	251	170	1.1	2++	OT	F	MT	translucent	mixed sizes of eggs
Munlo	9	1	RB	2	244	139	1.0	2++	OT	F	IM	translucent	
Munlo	10	1	RB	2	217	112	1.1	2++	OT	F	M	translucent	small fish with large eggs
Munlo	11	1	RB	2	262	194	1.1	2++	OT	F	IM	translucent	slightly coloured
Munlo	12	2	RB	2	248	168	1.1	2++	OT	F	M	translucent	large eggs present
Munlo	13	2	RB	2	226	121	1.0	2++	OT	F	IM		bright fish
Munlo	14	2	RB	2	229	123	1.0	2++	OT	F	IM	translucent	spotted
Munlo	15	2	RB	4	356	590	1.3	4+	OT	F	ST		dark lateral stripe
Munlo	16	2	RB	2	175	55	1.0	2++	OT	F	IM	translucent	bright fish
Munlo	17	2	RB	2	223	113	1.0	2++	OT	F	IM	translucent	bright fish
Munlo	18	2	RB	2	251	163	1.0	2++	OT	F	IM	translucent	
Munlo	19	2	RB	4	376	650	1.2	4+	OT	F	M		fat fish
Munlo	20	2	RB	5	384	690	1.2	5+	OT	M	M		dark fish,spotted,large teeth
Munlo	21	2	RB	5	408	810	1.2	5+	OT	F	M		fat fish,large teeth
Munlo	22	2	RB	4	375	730	1.4	4+	OT	F	ST		coloured,loose eggs
Munlo	23	2	RB	4	331	450	1.2	4+	OT	F	ST	translucent	loose eggs
Munlo	24	2	RB	2	181	63	1.1	2++	OT	F	IM		
Munlo	25	2	RB	2	165	48	1.1	2++	OT	F	IM		
Munlo	26	2	RB	2	280	270	1.2	2++	OT	F	IM	translucent	
Munlo	27	2	RB	2	266	220	1.2	2++	OT	F	IM	translucent	
Munlo	28	2	RB	2	241	161	1.2	2++	OT	F	MT	translucent	
Munlo	29	2	RB	2	235	140	1.1	2++	OT	F	IM		
Munlo	30	2	RB	2	227	129	1.1	2++	OT	F	MT		
Munlo	31	2	RB	2	249	200	1.3	2++	OT	F	IM	translucent	
Munlo	32	2	RB	2	206	90	1.0	2++	OT	F	IM	translucent	
Munlo	33	2	RB	2	243	162	1.1	2++	OT	F	MT	translucent	
Munlo	34	2	RB	2	235	129	1.0	2++	OT	F	IM	opaque center	