

## Executive Summary

## Berman Lake 2006

A stocking assessment was conducted at Berman Lake on June 3 and 4, 2006. Berman Lake was last assessed in 1999, however, it was not possible to evaluate the relative contribution of wild or hatchery stock to the fishery at that time. The management goal for Berman Lake is to maintain an average quality fishery for rainbow trout. Prior to this assessment, it was unclear whether wild rainbow trout recruitment was sufficient to meet the needs of the fishery or whether supplementation with hatchery fish was needed to support the fishery.

Berman Lake is 43.7 ha and is situated 37 km West of Prince George. A small regional park is located on the south shore of the lake via access off Highway 16W. Access to the lake is through the park following an approximately 50 metre walk.

The objective of the 2006 survey was to assess the approximate proportion of wild rainbow trout in Berman Lake by utilizing a marked cohort of hatchery rainbow trout yearlings that were stocked in 2005. Thirteen gill nets were set in Berman Lake on June 3 and 4, 2006 using short during (1.5 hour) sets to protect any lake trout that may have been encountered. A significant conservation concern for lake char exists on Bednesti Lake which is adjacent to Berman Lake. Nine multi-mesh floating (RISC standard mesh sizes) gillnets and three SLIN gillnet sets (1.5 inch mesh) were used in the survey. The total sampling effort was 19.75 hours, resulting in a moderate gillnet catch (CPUE) of 3.23 rainbow trout per net-hour. Based on this assessment, the fishery appears to be providing an average quality angling experience, as 51.1% of the fish sampled were between 250 - 300 mm in length and net catch rates were relatively high. The mean length of rainbow trout in the sub-sampled catch was 256 mm and 186 g where the majority of the fish were age-2. The contribution of stocked fish to this fishery was high, where 92.8% of the age-two rainbow trout collected were marked with an adipose fin clip, indicating that they were of hatchery origin.

Based on the results of this survey and in consideration of the moderate use of this fishery, it is recommended that the stocking program for rainbow trout in Berman Lake be continued to support this fishery. The next assessment should take place in approximately five years and should evaluate the lack of older age classes in the catch as a secondary objective.



Figure 1. Aerial photo of Berman Lake.

Omineca Region Stocked Lake Assessment Report

**OMINECA REGION  
LAKE STOCK ASSESSMENT REPORT**

**LAKE NAME:** Berman Lake      **ALIAS:** 0      **BC WBID:** 00392LCHL

**LAKE LOCATION:**      *Nearest center:* 37 km West Prince George      *Drainage:* FRASER  
*UTM:* 10.477767.5967179

**LAKE ATTRIBUTES:**      *Surface Area:* 43.7 Ha      *Elevation:* 807 m  
*Littoral Area:* Ha      *T.D.S.:* 103 ppm  
*Max Depth:* 16.4 m      *Mean depth:* 2.6 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       Zimmerman 1999; PG Lakes Files  
 Year(s) Surveyed:      1999; 1989; 1970

**STOCKING DATA:**

*Current Stocking Rate*      114      Fish/Ha      Annual  
*Stock Type*      **BLACKWATER DR**  
*Species*      RB; Mixed- no NPM  
*Previous Stocking Rate*      114

**SURVEY METHODS:**

Method	Date (yy.mm.dd)	Survey Agency	Crew
Fish	Mod. Gillnet      2006-06-03	BCCF	Marcel Macullo, Andrew Walker
Chem.	Profile; TDS      1970	MOE	Bustard and Janssen
Physical	Bathy.      1970	MOE	Bustard and Janssen
Temp.	Profile      1970	MOE	Bustard and Janssen

**Netting Specs:**      *Net type:* Standard Experimental      *Net length:* 90m (3x30m)  
*Setting:* Floating and Sinking      *Panel Mesh:* SGN and SLIN 1.5

**SURVEY RESULTS:**

**Catch**

	RB	LW	RSC	LKC	LSU	CSU	NSC	CAS	WF Sp.	LT
<b>2006</b>	63	44	0	1	83	0	0	0	0	0
<b>1999</b>	12	0	0	0	14	0	0	8	25	0
<b>1989</b>	4	50	0	0	8	0	0	0	0	0
-	0	0	0	0	0	0	0	0	0	0

Survey Year	2006	1999	1989	-
Effort Hours	19.5	23.75	6	
RB CPUE:	3.23	0.51	0.67	RB/Net Hour
EB CPUE:	0.00	0.00	0.00	EB/Net Hour
# of Sets:	13	2	1	

*Next Assessment :*      2011

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### ***SURVEY CONCLUSIONS:***

Objective	Objectives Achieved		Reason
	Yes	No	
1. Family	<input type="checkbox"/>	<input type="checkbox"/>	
2. Average	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Above Average	<input type="checkbox"/>	<input type="checkbox"/>	
4. Trophy	<input type="checkbox"/>	<input type="checkbox"/>	

### ***RECOMMENDATIONS:***

**Assessment:** 92.8% of age-2 rainbow trout were found to be marked hatchery fish, - therefore it is near certain that the Berman Lake trout fishery is being supported by the stocking program.

**Management:** Consider use of sterile stock in future years to protect Bednesti Lake stock from introgression with wild rainbow trout stock. (Bednesti Lake is located adjacent to Berman Lake).

**Comments:** Boat counts from 2005 and 2006 indicate Berman Lake generated approximately 244 and 250 angler days per year or 5.6 and -5.9 angler days/ Ha.

**Uncertainties:** The 2006 rainbow trout catch almost exclusively consisted of age-2 fish. Berman Lake rainbow trout may be migrating into Bednesti Lake at maturity, as one male, adipose-marked rainbow trout was located in an unrelated survey in Bednesti Lake in 2006. Weight data from 1999 survey is suspect- spring-type weight scales used likely underestimated weights. Species identification (particularly whitefish) of non-trout fish from previous surveys is also suspect- particularly for the 1999 survey.

### ***Recent Brood Request Comments:***

'Annual. Aerial survey 01, low angler use. Assessed in '99, possible natural recruitment. Needs further study. Request marked fish for '05-'06 to be assessed in '06-'07. Assessed in '06- preliminary results suggest good yield to fishery from hatchery program. Need to assess effort further.

### ***History of Angling Regulations***

No special restrictions

**Reported by:** Cory Williamson

**Date:** Feb-07

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**Table 1. Rainbow trout physical attributes for all sample years by age (1989, 1999 and 2006):**

Sample Year	Sample		Length (mm)				Weight (g)				Condition (k)				
	Age	Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Var
1989	1	1	132				23				1.00				
2006	2	50	250	196	297	21.0	172	102	280	35.3	1.09	0.95	1.35	0.1	0.01
2006	3	7	305	283	340	25.9	293	215	410	85.4	1.01	0.91	1.14	0.1	0.01
1999	3	3	267	215	338	63.7	133	25	300	146.5	0.51	0.25	0.78	0.3	0.07
1989	3	2	333	310	355	31.8	394	311	477	117.4	1.06	1.04	1.07	0.0	0.00
1999	4	6	279	248	310	26.1	158	75	250	68.3	0.69	0.49	0.84	0.1	0.02
1989	4	1	323				370				1.10				
1999	5	1	341				350				0.88				
1999	6	1	376				525				0.99				

**Table 2. Catch summary for sample years: 1989; 1999 and 2006.**

Sample Year	Sample		Length (mm)				Weight (g)				Condition (k)				
	Age	Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Var
2006	2	62	256	180	340	29.3	186	72	410	59.8	1.08	0.91	1.35	0.09	0.01
1999	3	12	293	215	376	47.3	215	25	525	147.1	0.72	0.25	1.08	0.23	0.05
1989	3	4	280	132	355	100.5	295	23	477	194.1	1.05	1.00	1.10	0.04	0.00

**Table 3. Proportion of Catch (by survey year)**

Survey Year	2006	1999	1989
Less than 250 mm	48.4 %	25.0 %	25.0 %
Between 250-300 mm	46.8 %	25.0 %	0.0 %
Between 300-400 mm	4.8 %	50.0 %	75.0 %
Greater than 400 mm	0.0 %	0.0 %	0.0 %
Greater than 500 mm	0.0 %	0.0 %	0.0 %

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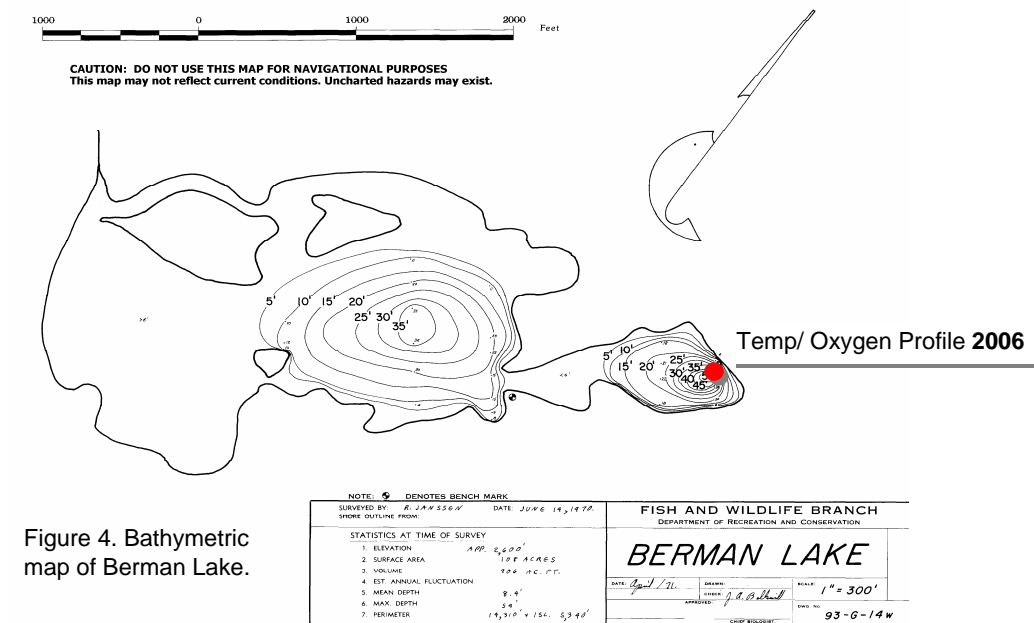
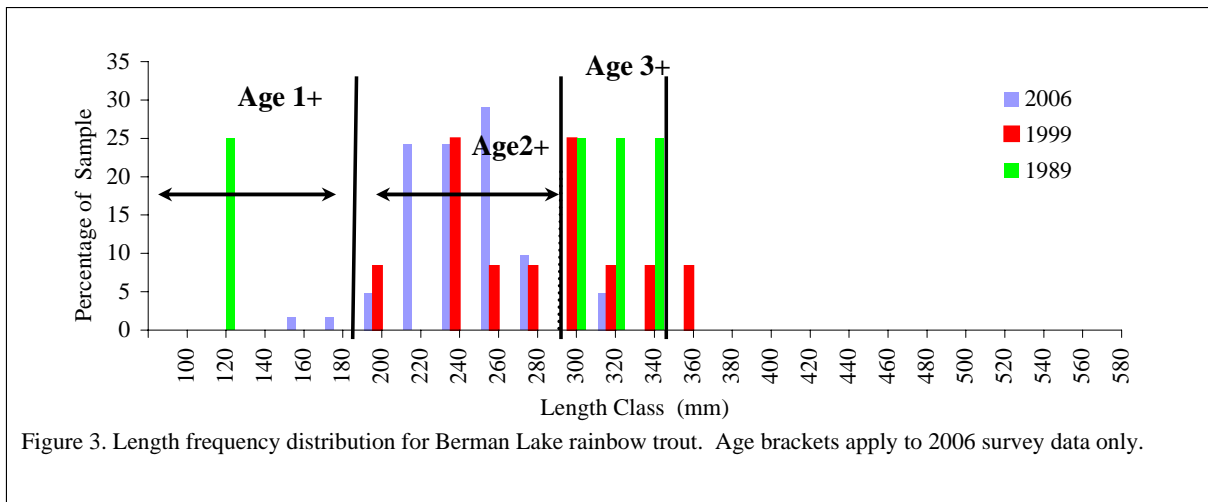
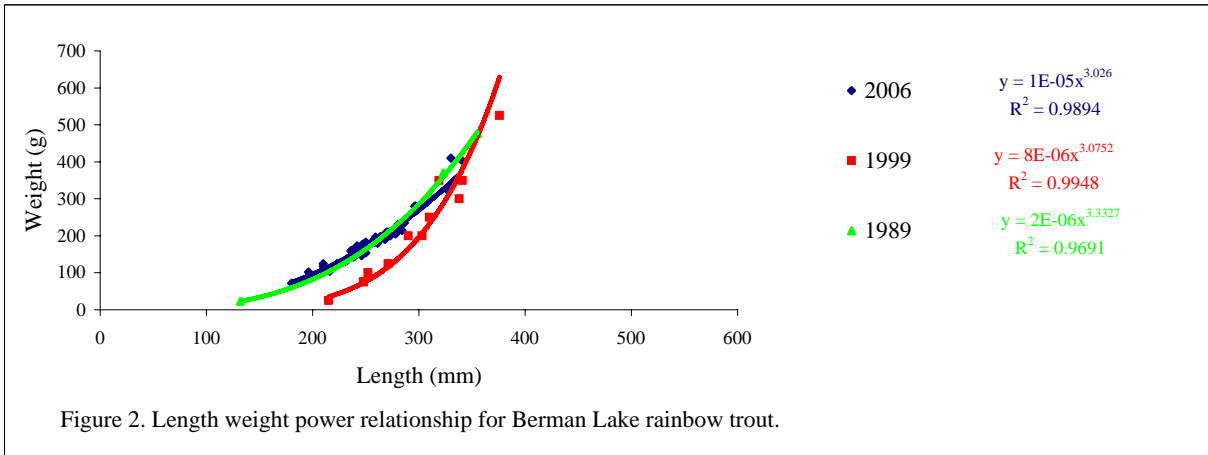


Figure 4. Bathymetric map of Berman Lake.

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**Table 4. Complete stocking History for Berman Lake to (1974-2006).**

Release Date	Species Name	Fish Count	Stock	Mark	Average Size (gm)	Life Cycle Stage
13-Jun-06	RB	5000	BLACKWATER DR		23.7	YEARLING
31-May-05	RB	5000	BLACKWATER DR	Adipose	25.69	YEARLING
25-May-04	RB	5000	BLACKWATER DR		20.62	YEARLING
29-May-03	RB	5000	BLACKWATER DR		22.57	YEARLING
5-Jun-02	RB	5000	BLACKWATER DR		29.67	YEARLING
28-May-01	RB	5000	BLACKWATER DR		18.76	YEARLING
1-Jun-00	RB	5000	BLACKWATER DR		22.17	YEARLING
14-Jun-99	RB	5000	BLACKWATER DR		26.88	YEARLING
17-Jun-98	RB	5000	BLACKWATER GE		21.01	YEARLING
30-May-97	RB	5000	BLACKWATER GE		7.21	YEARLING
30-May-96	RB	5000	BADGER TUNKWA		5.32	YEARLING
26-May-95	RB	4997	BLACKWATER DR		21.98	YEARLING
30-May-94	RB	5000	PREMIER DR		7.35	YEARLING
27-May-93	RB	5000	TUNKWA		3.37	YEARLING
30-May-92	RB	5000	NRT PREMIER		6.58	YEARLING
22-May-91	RB	5000	BADGER		16.1	YEARLING
5-Jun-90	RB	5000	BADGER		15.2	YEARLING
18-May-89	RB	5000	TUNKWA		7.3	YEARLING
1-May-88	RB	5000	TUNKWA		12.7	UNKNOWN
1-May-87	RB	5000	TUNKWA		15.6	UNKNOWN
1-May-86	RB	5000	NRT PREMIER		4.5	UNKNOWN
1-Jun-80	RB	15000	BADGER		6.3	UNKNOWN
1-Jan-79	RB	10000	NRT PREMIER		3.4	UNKNOWN
1-Jan-78	RB	10000	NRT PREMIER		4	UNKNOWN
1-Jan-76	RB	13300	PENNASK		1.4	UNKNOWN
1-Jan-74	RB	8600	PENNASK		2.5	FRY

**Table 5. Dissolved Oxygen/ Temperature Profile**

03-Jun-06 Station UTM 10.478745.596758					
Depth (m)	DO mg/L	DO %sat	Temp. °C	pH	Cond (25°C)
0	7.1	68	17.07	n/a	141
1	7.3	71	16.33	n/a	137
2	7.7	80	12.56	n/a	126
3	8.1	95	8.02	n/a	128
4	8	99	5.95	n/a	149
5	7.2	91	5	n/a	157
6	6.1	78	4.72	n/a	161
7	5.2	67	4.62	n/a	170
8	5	64	4.65	n/a	212 (Values Suspect)
9	4.7	60	4.78	n/a	244 (Values Suspect)
10	5.3	67	4.92	n/a	293 (Values Suspect)
11	4.8	61	4.98	n/a	358 (Values Suspect)
12	4.9	63	5.13	n/a	628 (Values Suspect)
13	5.3	67	5.2	n/a	1166 (Values Suspect)
14	6.1	77	5.3	n/a	2385 (Values Suspect)
15	7.1	89	5.36	n/a	2677 (Values Suspect)
16	7.6	95	5.37	n/a	2585 (Values Suspect)
17	7.8	98	5.37	n/a	2579 (Values Suspect)
18	7.9	99	5.37	n/a	2577 (Values Suspect)

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Table 6. Stock Assessment Data for 2006 (see lake files for additional survey data).

Lake	Sample#	Site	Number	Species Caught	Calendar Age	Length (mm)	Weight (grams)	Condition (k)	Age	Age Structure	Ageing Confidence (0-9)	Clip	Sex	Maturity
Berman	b1	1	1	rb	2*	229	130	1.1	2	ot	7	a	f	maturing
Berman	b2	1	1	rb	3*	328	320	0.9	3	ot	8		m	spawning
Berman	b3	1	1	rb	2*	238	153	1.1	2	ot	7	a	f	maturing
Berman	b4	1	1	rb	2*	274	205	1.0	2	ot	9	a	m	maturing
Berman	b5	1	1	rb	2*	261	188	1.1	2	ot	9	a	f	maturing
Berman	b6	2	1	rb	2*	243	162	1.1	2	ot	8	a	f	maturing
Berman	b7	2	1	rb	2*	196	102	1.4	2	ot	9		f	maturing
Berman	b8	2	1	rb	2*	239	148	1.1	2	ot	9	a	f	maturing
Berman	b9	2	1	rb	2*	236	160	1.2	2	ot	8	a	m	maturing
Berman	b10	2	1	rb	2*	223	125	1.1	2	ot	9		f	maturing
Berman	b11	2	1	rb	2*	226	127	1.1	2	ot	9	a	m	spawning
Berman	b12	2	1	rb	2*	260	192	1.1	2	ot	9	a	f	maturing
Berman	b13	2	1	rb	2*	262	185	1.0	2	ot	9	a	m	maturing
Berman	b14	2	1	rb	2*	261	180	1.0	2	ot	9	a	m	maturing
Berman	b15	2	1	rb	2*	236	141	1.1	2	ot	9	a	f	maturing
Berman	b16	2	1	rb	n/a	278	215	1.0		ot	-	a	f	maturing
Berman	b17	2	1	rb	2+	250	154	1.0	2	ot	9	a	f	maturing
Berman	b18	2	1	rb	2*	246	160	1.1	2	ot	9	a	m	maturing
Berman	b19	4	1	rb	2*	246	146	1.0	2	ot	9	a	m	maturing
Berman	b20	4	1	rb	2*	210	118	1.3	2	ot	7		f	maturing
Berman	b21	4	1	rb	2*	297	280	1.1	2	ot	8	a	f	maturing
Berman	b22	4	1	rb	2*	210	125	1.3	2	ot	8	a	f	maturing
Berman	b23	5	1	rb	2+	232	132	1.1	2	ot	9	a	m	maturing
Berman	b24	5	1	rb	2*	230	130	1.1	2	ot	8	a	f	maturing
Berman	b25	5	1	rb	2+	232	138	1.1	2	ot	9		f	maturing
Berman	b26	7	1	rb	3*	286	235	1.0	3	ot	7		m	maturing
Berman	b27	7	1	rb	3+	340	405	1.0	3	ot	7		f	maturing
Berman	b28	7	1	rb	2*	250	183	1.2	2	ot	9	a	f	maturing
Berman	b29	7	1	rb	2*	278	210	1.0	2	ot	9	a	f	maturing
Berman	b30	7	1	rb	2*	273	200	1.0	2	ot	8	a	m	maturing
Berman	b31	7	1	rb	2*	268	205	1.1	2	ot	9	a	f	maturing
Berman	b32	7	1	rb	2*	264	198	1.1	2	ot	8	a	f	maturing
Berman	b33	7	1	rb	2*	259	196	1.1	2	ot	8	a	f	maturing
Berman	b34	8	1	rb	2*	257	184	1.1	2	ot	4	a	f	maturing
Berman	b35	8	1	rb	n/a	258	182	1.1		ot	-	a	m	maturing
Berman	b36	8	1	rb	2*	238	162	1.2	2	ot	8		f	maturing
Berman	b37	8	1	rb	2*	239	143	1.0	2	ot	9	a	m	maturing
Berman	b38	8	1	rb	2*	269	205	1.1	2	ot	8	a	f	maturing
Berman	b39	8	1	rb	2*	236	158	1.2	2	ot	9	a	f	maturing
Berman	b40	8	1	rb	2+	239	153	1.1	2	ot	9	a	m	maturing
Berman	b41	8	1	rb	2*	278	205	1.0	2	ot	9	a	f	maturing
Berman	b42	8	1	rb	2*	250	182	1.2	2	ot	8	a	f	maturing
Berman	b43	8	1	rb	3*	286	235	1.0	3	ot	7		m	maturing
Berman	b44	8	1	rb	2+	240	151	1.1	2	ot	6	a	f	maturing
Berman	b45	9	1	rb	n/a	250	174	1.1		none	-	a	m	maturing
Berman	b46	9	1	rb	2+	275	210	1.0	2	ot	7		f	maturing
Berman	b47	9	1	rb	2*	247	177	1.2	2	ot	9	a	f	maturing
Berman	b48	9	1	rb	2*	216	104	1.0	2	ot	9		f	maturing
Berman	b49	9	1	rb	3*	283	230	1.0	3	ot	8		f	maturing
Berman	b50	10	1	rb	3*	330	410	1.1	3	ot	8		f	spawning
Berman	b51	10	1	rb	2*	256	184	1.1	2	ot	9		m	maturing
Berman	b52	10	1	rb	2*	242	173	1.2	2	ot	9	a	f	spawning
Berman	b53	10	1	rb	3*	284	215	0.9	3	ot	8		f	spawning
Berman	b54	10	1	rb	2*	268	190	1.0	2	ot	8		f	spawning
Berman	b55	11	1	rb	2*	271	205	1.0	2	ot	8		f	spawning
Berman	b56	11	1	rb	2*	272	210	1.0	2	ot	9		m	spawning
Berman	b57	11	1	rb	n/a	270	210	1.1	2	ot	-	a	f	spawning
Berman	b58	11	1	rb	n/a	248	173	1.1	2	ot	-	a	f	maturing
Berman	b59	11	1	rb	n/a	296	280	1.1		ot	-		f	spawning
Berman	b60	12	1	rb	n/a	280	230	1.0	2	ot	-	a	f	maturing
Berman	b61	12	1	rb	n/a	270	200	1.0	2	ot	-	a	f	maturing
Berman	b62	13	1	rb	n/a	180	72	1.2		ot	-		f	immature