

Executive Summary

Stern Lake

1999

A fisheries stock assessment was conducted on July 23, 1999 by the Carrier Sekani Tribal Council at Stern Lake. A standard floating gillnet was set for 17.5 hours resulting in a gillnet catch per unit effort of 8.57 rainbow trout per net hour. The maximum size of the rainbow trout captured was 47.3 cm with a mean size of 24 cm. Most of the rainbow trout sampled were 24-40 cm.

Stern Lake was first assessed on July 16, 1977 where it was determined that a naturally viable population of rainbow trout existed. Rainbow trout up to 48 cm were captured during the assessment. On June 16, 1976 a report was provided to the Ministry of Environment that large rainbow trout up to 12 pounds were congregating at the mouth of the outlet stream where they were unable to navigate past numerous beaver dams. It was also reported that anglers were harvesting these fish fairly heavily.

Stern Lake is 137 hectares and is located 22 km northwest of Fraser Lake. Stern Lake was stocked in 1988, 1995, and 1996 and it has since been determined that Stern Lake would be better managed as a wild rainbow trout fishery. There is considerable evidence that suggests that the benefits associated with stocking rainbow trout in mixed species lakes do not outweigh the possible risks if genetic introgressions occur with native stocks. Stocked rainbow trout in the Omineca Region do not appear to perform well where there are naturally-sustaining rainbow trout populations and other fish species present. There is no existing data on the fish species distribution for Stern Lake other than rainbow trout, with the exception that it has been noted that there is a "coarse" fish population.

During the spring of 1983 Ducks Unlimited Canada requested permission to install a dam on the outlet stream in order to increase the lake elevation and improve waterfowl habitat. At that time Ducks Unlimited were willing to put in a fish way to allow the passage of fish through their dam. Fisheries staff determined that a fish way was unnecessary as there was limited spawning habitat available in the Stern Lake outlet. It was also determined that a small inlet stream located in the north-central portion of Stern Lake would be sufficient as a spawning location if habitat enhancements were undertaken. In fact, fisheries staff felt that a dam, maintaining at minimum an 18 inch vertical drop, would be beneficial for two reasons: (1) coarse fish would be prevented from entering the lake; (2) the lake level would be increased, thus providing improved habitat for rainbow trout. It was felt that the lake was a good candidate for chemical rehabilitation so a coarse fish barrier would be beneficial. Chemical rehabilitation never occurred at Stern Lake. One problem that may exist as a result of the installation of the dam on the outlet stream is that Stern Lake periodically winterkills; thus, the rainbow trout population requires recruitment from an external source to maintain a viable population. The assessment conducted in 1983 suggested that the only stream suitable for natural recruitment above the dam required habitat enhancements. The habitat enhancements were not completed on this tributary.

The Stern Lake outlet and dam structure were investigated by MOE fisheries staff in 2005 and it was determined that there is no longer connectivity to Stern Lake as a result of dam construction. Fisheries staff also discovered a tributary stream with a channel varying between 2-3 metres that flows into Stern Creek approximately 400 m downstream from the dam structure. Visual observation determined that the small stream contained an abundant population of rainbow trout fry. It is recommended that Stern Lake be re-assessed to determine: (1) how much natural recruitment is occurring above the dam structure; (2) the fish species assemblage present at this time; (3) a determination of rainbow trout population status above the dam structure. After the Stern Lake assessment is completed potential mitigation activities to the dam structure will be discussed. The re-establishment of connectivity downstream of the dam may be an excellent project for a local Fish and Game club looking for conservation projects and a potential project for HCTF funding in 2007.

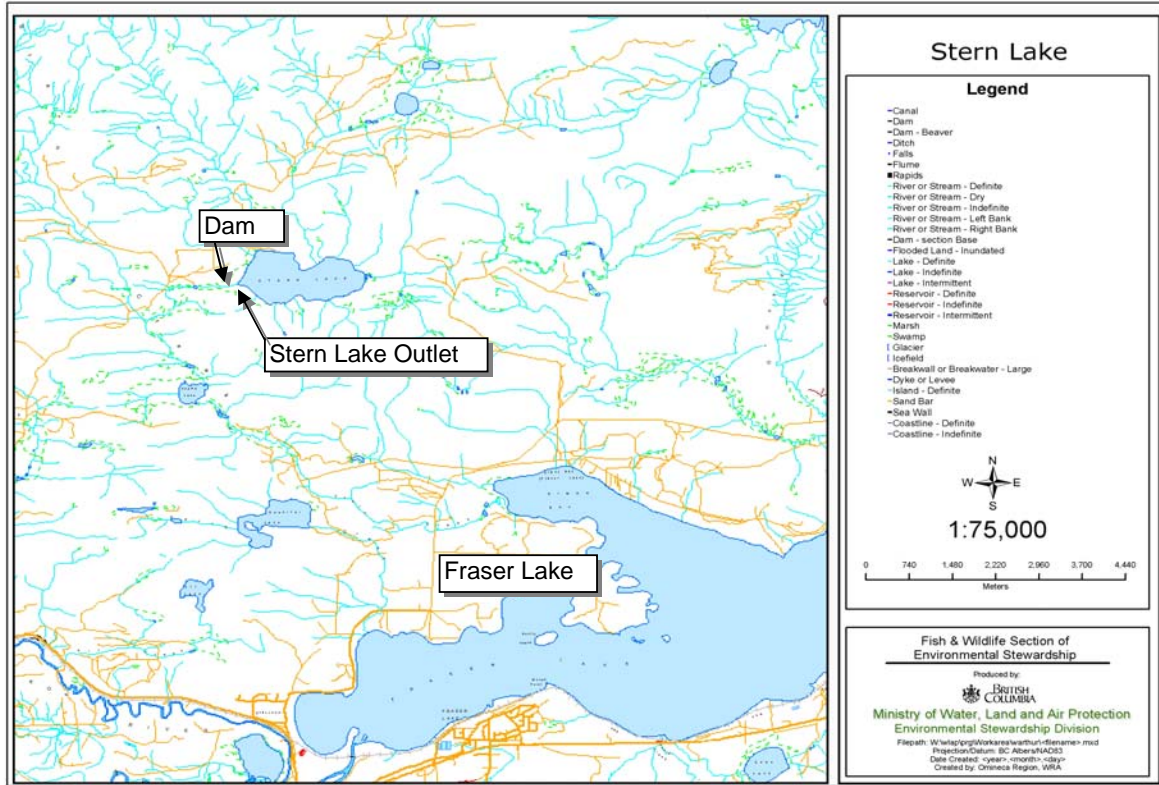


Figure 1. Map showing the location of the dam installed to improve waterfowl habitat on Stern Lake



Figure 2. Picture of dam structure located on the outlet of Stern Lake taken July, 2005. The steel structure is located beneath the willow branches in the photo.

**OMINECA REGION
LAKE STOCK ASSESSMENT REPORT**

LAKE NAME: Stern **BC WBID:** 00563FRAN

LAKE LOCATION: *Nearest center:* 22 km NW Fraser Lake *Drainage:* FRASER

UTM: 10.37600.600000

LAKE ATTRIBUTES: *Surface Area:* 137.4 Ha *Elevation:* 790 m
Littoral Area: 137 Ha *T.D.S.:* 68 ppm
Max Depth: 3 m *Mean depth:* 2.2 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: 1977, 1999

STOCKING DATA:

Current Stocking Rate Stocking ceased
Stock Type
Species RB mixed
Previous Stocking Rate 36 Fish/ha

SURVEY METHODS:

Method	Date (yy.mm.dd)	Survey Agency	Crew
Fish	SGN 1999-07-23	CSTC	unknown
Chem.	Do, pH 1977-06-17	MOE	unknown
Physical	bathymetric 1977-06-17	MOE	unknown
Temp.	profile 1977-06-17	MOE	unknown

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
1999	150	0	0	0	0	0	0	0	0	0
1977	10	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0

Survey Year	1999	1977
Effort Hours	17.5	14
RB CPUE:	8.57	0.71
EB CPUE:	0.00	0.00
# of Sets:	1	3

Next Assessment **2006**

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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: The next assessment is scheduled for the summer of 2006 in order to assess the fish species assemblage found in Stern Lake and determine the amount of spawning habitat available above the dam.

Management: Stern Lake was stocked for the last time in 1996 and is now being managed as a wild fishery with no further enhancement activities planned.

Comments: Mitigation to the dam structure needs to be considered to allow rainbow trout to migrate into Stern lake.

Uncertainties: An assessment needs to be completed to determine if the dam located at the outlet stream is limiting natural recruitment or re-colonization from occurring.

Recent Brood Request Comments:

Last stocked in 96. Assessed in 99. Slow growth, good yield. Extensive natural recruitment. May consider cessation of stocking. Reassess '04.

History of Angling Regulations

There are no special angling regulations for Stern Lake.

Reported by: Adrian Clarke
Date: Jun-05

Table 1. Rainbow trout physical attributes for 1999 by age:

Sample Year	Sample		Length (mm)				Weight (g)				Condition (k)				
	Age	Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Var
1999	1	1	150				30				0.89				
1999	3	2	265	251	278	19.1	102	98	105	4.9	0.55	0.49	0.62	0.1	0.01
1999	4	28	320	248	390	32.1	230	40	600	115.6	0.66	0.20	1.06	0.2	0.04
1999	5	13	363	321	400	24.2	360	180	498	113.5	0.74	0.41	1.10	0.2	0.03
1999	6	1	435				525				0.64				
1999	7	2	437	400	473	51.6	697	532	862	233.3	0.8	0.81	0.83	0.0	0.00

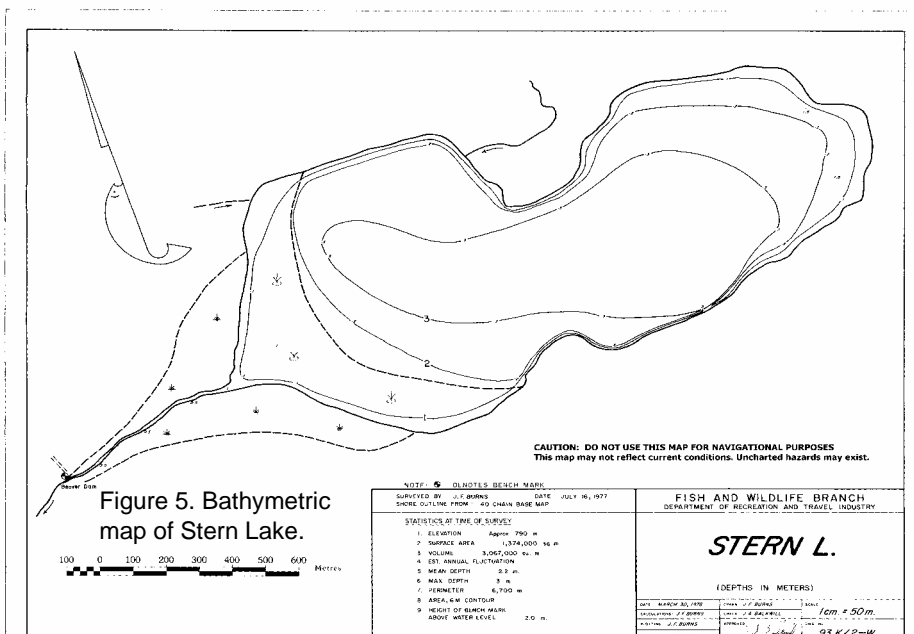
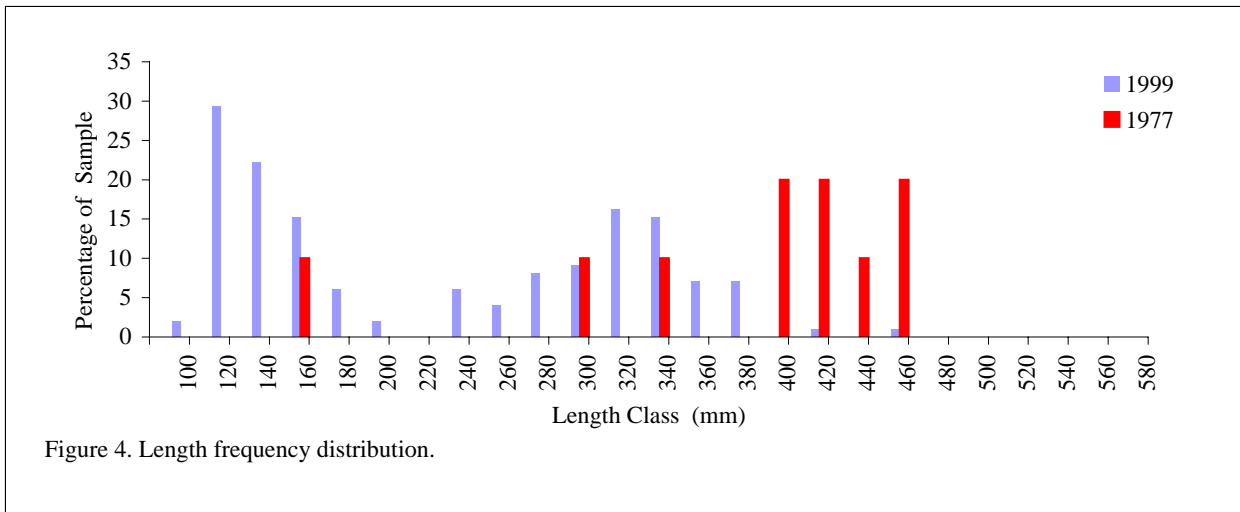
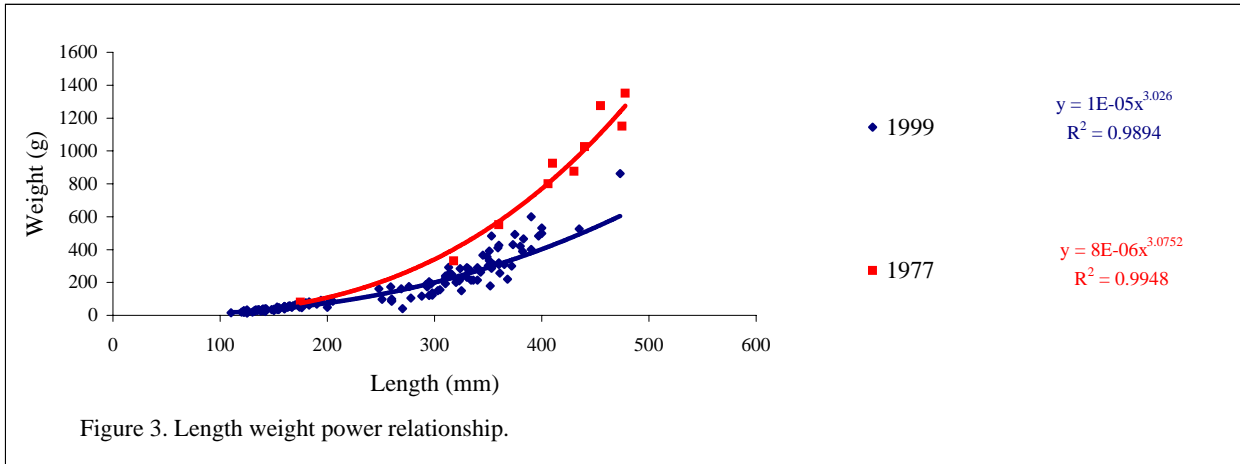
Table 2. Catch summary for all sample years.

Sample Year	Sample														
	Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Var	
1999	150	240	110	473	97.5	157	14	862	154.0	0.93	0.20	1.74	0.29	0.08	
1977	10	395	175	478	97.5	836	80	1350	409.8	1.22	1.03	1.49	0.14	0.02	

Table 3. Proportion of Catch (by survey year)

Survey Year	1999	1977
Less than 250 mm	51.3 %	10.0 %
Between 250-350 mm	30.7 %	10.0 %
Between 250-400 mm	47.3 %	20.0 %
Greater than 400 mm	2.7 %	70.0 %
Greater than 500 mm	0.0 %	0.0 %

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* ANGLER'S NAME * HEIGHT OF BENCH MARK ABOVE WATER LEVEL 2.0 m.	DATE: 08/20/04 LOCATION: J.P. BROWN TIME: 10:00 AM BY: J.P. BROWN	DATE: 08/20/04 LOCATION: J.P. BROWN TIME: 10:00 AM BY: J.P. BROWN 93 K/2-W
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Table 4. Stocking History for Stern Lake to 2004.

Release Date	Species Name	Fish Count	Stock	Mark	Average Size (gm)	Life Cycle Stage
31-May-96	RB	2500	BADGER TUNKWA		8.13	YEARLING
11-Jun-95	RB	5000	BLACKWATER GE		11.76	YEARLING
1-May-88	RB	5000	TUNKWA		9.9	UNKNOWN

Table 5. Dissolved Oxygen/ Temperature Profile

16-Jul-77					
Depth (m)	DO mg/L	DO %sat	Temp. °C	pH	TDS
0	6		17.2	7.0	68
1					
2					
3			17.1		
4	bottom				

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

Lake	Sample#	Site	Species Caught	Age	Length (mm)	Weight (grams)	Condition (k)	Scale Age
Stern	1	1	rb	6	435	525	0.6	6
Stern	2	1	rb	4	320	200	0.6	4
Stern	3	1	rb	4	310	192	0.6	4
Stern	4	1	rb	5	352	180	0.4	5
Stern	5	1	rb	5	380	420	0.8	5
Stern	6	1	rb	5	382	390	0.7	5
Stern	7	1	rb	4	303	150	0.5	4
Stern	8	1	rb		260	90	0.5	
Stern	9	1	rb		260	100	0.6	
Stern	10	1	rb	5	340	290	0.7	5
Stern	11	1	rb	4	270	40	0.2	4
Stern	12	1	rb	4	330	290	0.8	4+
Stern	13	1	rb	4	325	150	0.4	4
Stern	14	1	rb	5	360	310	0.7	5
Stern	15	1	rb	1	150	30	0.9	1+
Stern	16	1	rb	4	316	250	0.8	4
Stern	17	1	rb	4	295	120	0.5	4
Stern	18	1	rb	4	310	225	0.8	4
Stern	19	1	rb	4	324	226	0.7	4
Stern	20	1	rb	4	336	215	0.6	4
Stern	21	1	rb	5	321	210	0.6	5
Stern	22	1	rb	3	251	98	0.6	3+
Stern	23	1	rb	4	390	600	1.0	4
Stern	24	1	rb	4	340	215	0.5	4
Stern	25	1	rb	5	383	465	0.8	5
Stern	26	1	rb	4	331	286	0.8	4
Stern	27	1	rb	4	288	116	0.5	4
Stern	28	1	rb	5	355	310	0.7	5
Stern	29	1	rb	5	360	426	0.9	5
Stern	30	1	rb	4	305	156	0.5	4
Stern	31	1	rb	4	322	226	0.7	4
Stern	32	1	rb	NS	313	292	1.0	NS
Stern	33	1	rb	5	353	482	1.1	5
Stern	34	1	rb	7	473	862	0.8	7
Stern	35	1	rb	5	334	215	0.6	5+
Stern	36	1	rb	5	400	498	0.8	5+
Stern	37	1	rb	4	298	122	0.5	4
Stern	38	1	rb	4	350	302	0.7	4+
Stern	39	1	rb	4	345	365	0.9	4+
Stern	40	1	rb	3	278	105	0.5	3+
Stern	41	1	rb	7	400	532	0.8	7
Stern	42	1	rb	4	260	86	0.5	4
Stern	43	1	rb	4	298	136	0.5	4
Stern	44	1	rb	4	248	162	1.1	4
Stern	45	1	rb	5	397	482	0.8	5
Stern	46	1	rb	4	365	310	0.6	4
Stern	47	1	rb	4	373	430	0.8	4
Stern	48	1	rb	4	349	356	0.8	4+
Stern	49	1	rb	4	324	284	0.8	4
Stern	50	1	rb	4	330	232	0.6	4