Executive Summary Casey Lake 2006

Casey Lake was initially stocked with rainbow trout in 1993 with the intent to have Fraser Lake Elementary School involved in the assessment and management of the lake. At that time, the management goal for Casey Lake was for a moderate-use rainbow trout fishery regulated with special restrictions including: single-barbless hooks and a bait ban. The expectation for the lake was to achieve a fishery that provided opportunities for rainbow trout > 40 cm in length. Casey Lake was closed to sport fishing from 1993-1995 to allow for the rainbow trout to reach an adequate size for capture.

A stocking assessment was completed on the 14 and 15 of September 2006 as a follow-up to the 1999 survey to better understand the dynamics of this fishery. The first assessment post-stocking was conducted in 1995. At that time, the rainbow trout were growing well and it was determined that some three-year old fish were greater 40 cm in length and were very abundant as shown by the gillnet catch per unit effort (CPUE) of 4.61 fish per net hour. The second assessment conducted in 1999 found that the majority of the gillnet catch was comprised of rainbow trout 25-40 cm with no fish > 40 cm. The third assessment completed in 2006 found a mean fish size of 327 mm and 467 g, with close to 30% of the catch being over 40 cm. Many of the larger fish, however, were in poor condition following maturation the previous spring. Casey Lake is a "closed" lake system without spawning habitat. It is likely that the decline observed in the size distribution of Casey Lake rainbow trout between the stock assessments conducted in 1995 and 1999 was due to normal changes in fishery productivity following the initial stocking and is not a cause for concern. Mean fish size in the 2006 survey was actually higher that previous surveys as substantial numbers of fish from age classes 3-5 were present in the catch. Previous surveys were conducted in spring whereas the 2006 survey was completed in fall, allowing for and extra season of growth. The lake is currently stocked at a low annual rate of 87 fish/hectare. Casey Lake is relatively productive as shown by the measured filterable residue (TDS) value of 100 mg/l. Considering the relatively low stocking densities and adequate lake productivity, and the spawn bound condition of fish greater than 40 cm in length, fishery management objectives for this lake could be better achieved with a change in trout strain. It is therefore recommended that a sterile rainbow trout strain be used in future to improve the quality of the fish in the fishery that are greater than 40 cm. To assess this change, the next stock assessment should be completed in 2011.

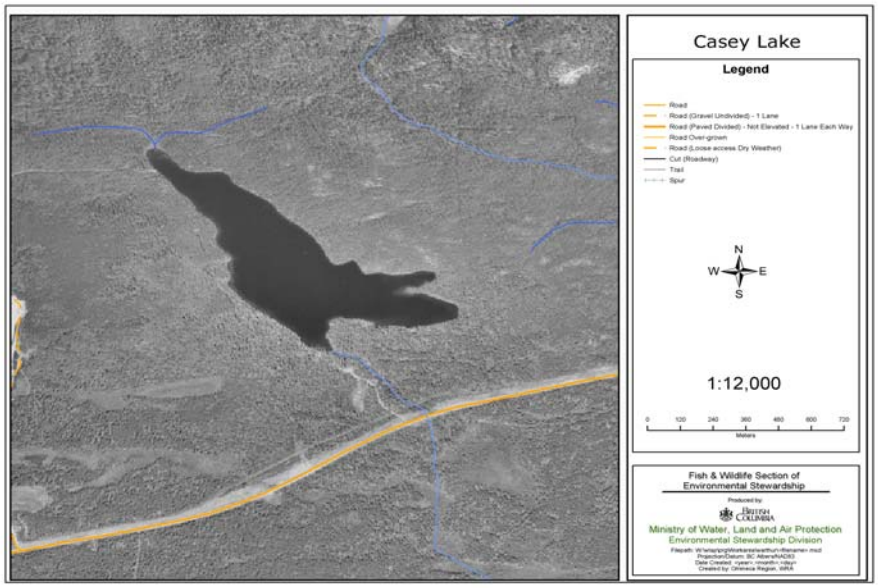

Figure 1. Orthophoto map of Casey Lake showing Highway 16 West in the foreground.

OMINECA REGION
LAKE STOCK ASSESSMENT REPORT

LAKE NAME: Casey ***BC WBID:*** 00984FRAN

LAKE LOCATION: *Nearest center:* 15 km west of Fraser lake *Drainage:* FRASER
UTM: 10.365103.5991478

LAKE ATTRIBUTES:

Surface Area:	28.6 Ha	*Elevation:*	930 m
Littoral Area:	25.8 Ha	*T.D.S.:*	100 ppm
Max Depth:	8.1 m	*Mean depth:*	2.7 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, > 40 cm for EB)	☐

MANAGEMENT/SURVEY HISTORY:

Previous gill net assessment(s): no ☐ yes ☒ M. J. Hunter 1991
Year(s) Surveyed: 1991, 1995, 1998

STOCKING DATA:

Current Stocking Rate	87	Fish/Ha	Annually
Stock Type	**PENNASK PREMIER**		
Species	RB mixed		
Previous Stocking Rate	87		

SURVEY METHODS:

Method		Date (yy.mm.dd)	Survey Agency	Crew
Fish	SGN	2006-09-14	BCCF	Dawn Cowie, Marcel Macullo
Chem.	DO, pH, Cor	1991-09-20	MOE	Duane Jesson
Physical	bathymetric	1991-09-20	MOE	Duane Jesson
Temp.	profile	1991-09-20	MOE	Duane Jesson

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

SURVEY RESULTS:

Catch

	RB	EB	RSC	LKC	LSU	CSU	NSC	CAS	BT	LT
2006	38	0	4	0	0	0	0	0	0	0
1999	20	0	167	0	0	0	0	0	0	0
1995	70	0	0	0	0	0	0	0	0	0

Survey Year	**2006**	**1999**	**1995**
Effort Hours	33.11	16.5	15.2
RB CPUE:	2.30	1.32	4.61
EB CPUE:	0.00	0.00	0.00
# of Sets:	1	1	2

Next Assessment : 2011

SURVEY CONCLUSIONS:

Objective	Objectives Achieved Yes	No	Reason
1. Family	☐	☐	
2. Average	☑	☐	Good distribution of size classes, larger fish are spawn bound.
3. Above Average	☐	☐	
4. Trophy	☐	☐	

RECOMMENDATIONS:

Assessment: Reasonable abundance of fish up to age five, however fish age 4 and 5 are of low quality due to spawn-bound condition.

Management: Change strain to AF3N to improve fishery quality to meet the objective of having more 40 cm+ fish in the fishery. Recommend effort assessment using remote camera and single access point creel.

Comments: The objective of an average sport-fishery is being met with a 30% of the catch being greater than 40 cm.

Uncertainties: Angling effort is unknown.
The 1999 rainbow trout weights were suspect as Fulton's condition factor values ranged from 0.4-1. All weights were adjusted to a condition factor of 1 to allow for size class comparisons between 1995 and 1999 for the length weight power relationship. 1999 weights and condition factors were excluded from all other tables and figures.

Recent Brood Request Comments:

2006-2007 Annual. Change stock to blackwater- red-side shiners are present. Data collected in 1999 was inconclusive due to poor quality of data collected by contractor. Re-assess in 2006 or 2007 before changes to management/ stocking densities

2005 Annual. Change stock to BW- RSS are present. Consider reduction in stocking rate for 2006 after data review is complete.

2004 Assessed in 1999. Fish to 36 cm captured; suggest reassess in 2003.

History of Angling Regulations

Bait-ban, single-barbless hook, and an engine power restriction of 75 Kw (10 hp). Closed to angling between 1993 and 1995.

Reported by: Cory Williamson
Date: Mar-07
Updated from report prepared by Adrian Clarke in 2005

Table 1. Rainbow trout physical attributes for Casey Lake in 1995;1999 and 2006.

			Length (mm)				Weight (g)				Condition (k)			
Sample Year	Age	Sample Size	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev	Mean	Min	Max	StdDev
2006	1	4	139	120	172	23.1	28	18	51	15.3	1.00	0.91	1.05	0.1
2006	2	7	250	216	280	23.7	202	132	265	46.3	1.27	1.14	1.46	0.1
1999	2	1	145				30				0.98			
1995	2	16	334	189	400	50.3	436	90	660	163.9	1.12	0.69	1.33	0.1
2006	3	9	360	290	421	39.0	485	280	680	110.8	1.04	0.71	1.16	0.1
1999	3	11	283	240	329	24.6	229	140	340	57.1	1.00	0.95	1.04	0.0
1995	3	12	316	196	412	70.1	412	100	770	229.7	1.17	1.06	1.33	0.1
2006	4	12	412	360	460	29.1	728	470	900	135.0	1.03	0.87	1.21	0.1
1999	4	7	320	300	352	18.7	324	260	420	53.5	0.98	0.96	1.04	0.0
1995	4	1	418				760				1.04			
2006	5	2	437	388	486	69.3	905	580	1230	459.6	1.03	0.99	1.07	0.1

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
2006	37	327	120	486	103.1	467	18	1230	301.3	1.09	0.71	1.46	0.15
1999	20	290	145	352	43.9	256	30	420	87.0	0.99	0.95	1.04	0.03
1995	70	301	189	418	63.8	350	80	770	193.7	1.15	0.69	1.33	0.11

Table 3. Proportion of Catch (by survey year)

Survey Year	2006	1999	1995
Less than 250 mm	24.3 %	10.0 %	28.6 %
Between 250-300 mm	13.5 %	40.0 %	14.3 %
Between 300-400 mm	32.4 %	50.0 %	51.4 %
Greater than 400 mm	29.7 %	0.0 %	5.7 %
Greater than 500 mm	0.0 %	0.0 %	0.0 %

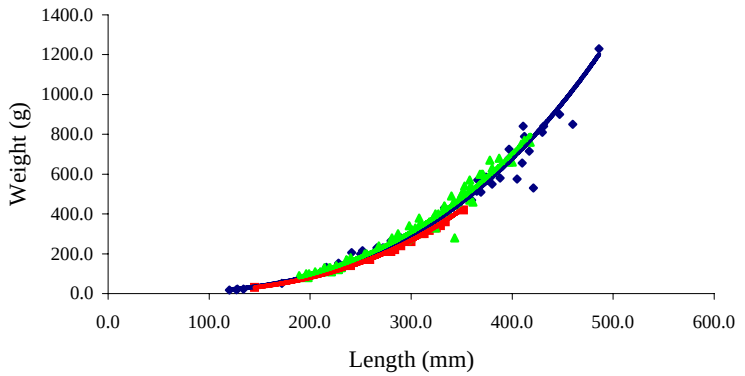

Figure 2. Length weight power relationship for Casey Lake rainbow trout. Note: All 1999 weights adjusted to condition factor = 1 for comparison with 1995 due to erroneous weight data.

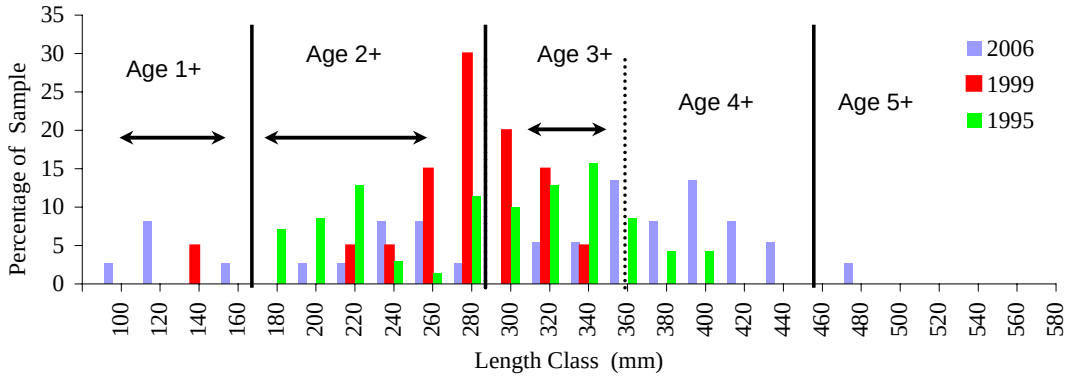

Figure 3. Length frequency distribution. Note: Age class brackets apply to the 2006 data only and the dotted line represents the approximate division between age classes.

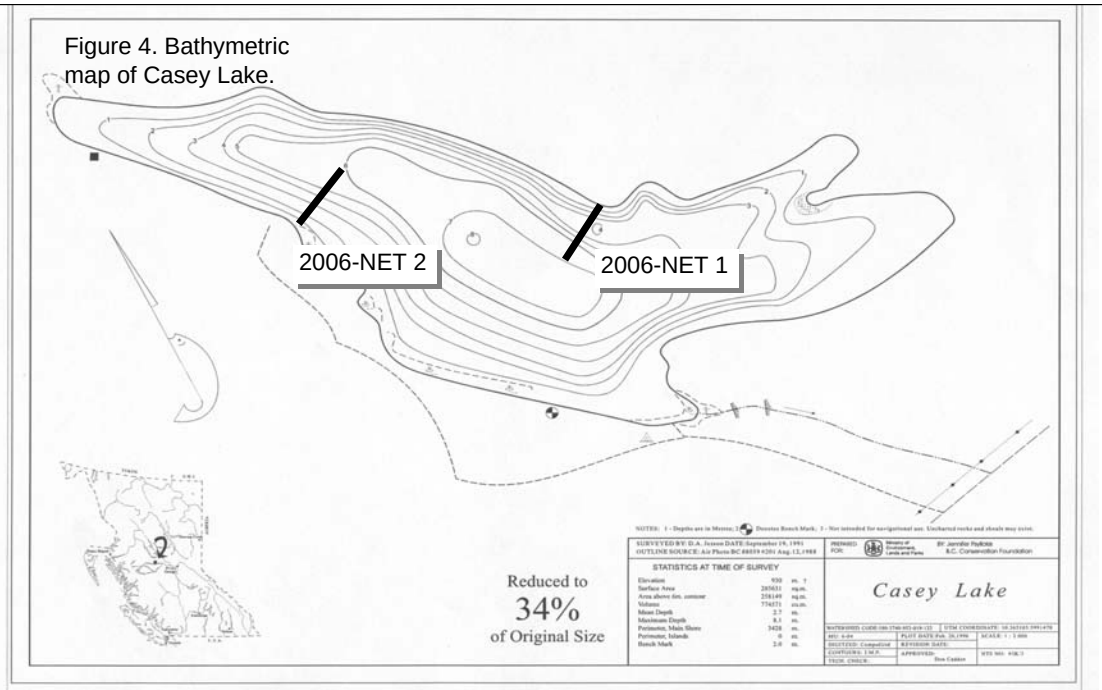

Figure 4. Bathymetric map of Casey Lake.

Table 4. Complete stocking history for Casey Lake 1993-2006.

Release Date	Species Name	Fish Count	Stock	Mark	Average Size (gm)	Life Cycle Stage
10-Jun-06	RB	2500	PENNASK PREMIER		8.1	YEARLING
9-Jun-05	RB	2500	TUNKWA		12.3	YEARLING
1-Jun-04	RB	2500	TUNKWA		9.02	YEARLING
5-Jun-03	RB	2500	BADGER TUNKWA		8.4	YEARLING
19-Jun-02	RB	2500	BADGER TUNKWA		15.87	YEARLING
30-May-01	RB	2500	NRT DRAGON		9.52	YEARLING
31-May-00	RB	2500	NRT PREMIER		9.13	YEARLING
2-Jun-99	RB	2500	PENNASK		6.52	YEARLING
29-May-98	RB	2500	BADGER TUNKWA		7.75	YEARLING
19-Jun-97	RB	5000	BADGER TUNKWA		8.33	YEARLING
31-May-96	RB	2500	BADGER TUNKWA		8.13	YEARLING
12-Jun-95	RB	2500	BLACKWATER GE		11.76	YEARLING
9-Jun-94	RB	5000	TUNKWA		10.41	YEARLING
28-May-93	RB	5000	TUNKWA		2.94	YEARLING

Table 5. Dissolved oxygen/ temperature profile for Casey Lake in 1991.

19-Sep-91		Station UTM	**10.365103.5991478**		
Depth (m)	**DO mg/L**	**DO %sat**	**Temp. ^{0}C**	**pH**	**Cond (25^{o}C)**
0	9		13.8	8.1	102
1	8.3		13.8		
2	8.6		13.7		
3	8.6		13.5		
4	8.1		13.4		
5	7.7		13.1		
6	7.6		13		
7	7.1		13	8.0	102
7.5	5.5		12.3		
8	bottom				

Table 6. Stock assessment data for Casey Lake in 2006 (see lake files for additional survey data).

Lake	Sample#	Site	Number	Species Caught	Origin	Age2	Length (mm)	Weight (grams)	Condition (k)	Age	Structure	Cond. Code	Clip	Sex	Maturity
Casey	c1	1	1	rb	5++	5	486	1230	1.1	5	ot	5		f	maturing
Casey	c2	1	1	rb	4++	4	430	810	1.0	4	ot	7		m	mature
Casey	c3	1	1	rb	3++	3	350	470	1.1	3	ot	7		f	mature
Casey	c4	1	1	rb	3++	3	365	515	1.1	3	ot	7		f	mature
Casey	c5	1	1	rb	3++	3	397	680	1.1	3	ot	7		m	mature
Casey	c6	1	1	rb	3++	3	331	400	1.1	3	ot	8		m	mature
Casey	c7	1	1	rb	2++	2	266	230	1.2	2	ot	8		m	maturing
Casey	c8	1	1	rb	2++	2	272	230	1.1	2	ot	8		f	maturing
Casey	c9	1	1	rb	n/a		252	215	1.3			-		m	maturing
Casey	c10	1	1	rb	2++	2	250	200	1.3	2	ot	8		f	maturing
Casey	c11	1	1	rb	2++	2	228	153	1.3	2	ot	5		f	maturing
Casey	c12	1	1	rb	2++	2	216	132	1.3	2	ot	6		m	maturing
Casey	c13	1	1	rb	n/a		127	20	1.0		ot	-		u	immature
Casey	c14	1	1	rb	1++	1	134	22	0.9	1	ot	8		f	immature
Casey	c15	1	1	rb	1++	1	128	22	1.0	1	ot	7		u	immature
Casey	c16	2	1	rb	4++	4	460	850	0.9	4	ot	8		m	maturing
Casey	c17	2	1	rb	4++	4	447	900	1.0	4	ot	6		m	spent
Casey	c18	2	1	rb	4++	4	411	840	1.2	4	ot	8		m	mature
Casey	c19	2	1	rb	3++	3	421	530	0.7	3	ot	6		m	mature
Casey	c20	2	1	rb	4++	4	405	575	0.9	4	ot	7		m	mature
Casey	c21	2	1	rb	4++	4	397	725	1.2	4	ot	6		f	spawnbou
Casey	c22	2	1	rb	4++	4	366	570	1.2	4	ot	7		m	mature
Casey	c23	2	1	rb	4++	4	412	790	1.1	4	ot	7		f	maturing
Casey	c24	2	1	rb	4++	4	417	715	1.0	4	ot	6		f	maturing
Casey	c25	2	1	rb	n/a		374	585	1.1			-		f	maturing
Casey	c26	2	1	rb	3++	3	333	430	1.2	3	ot	7		f	maturing
Casey	c27	2	1	rb	5++	5	388	580	1.0	5	ot	6		m	mature
Casey	c28	2	1	rb	3++	3	380	550	1.0	3	ot	7		f	maturing
Casey	c29	2	1	rb	4++	4	360	470	1.0	4	ot	6		f	spent
Casey	c30	2	1	rb	4++	4	410	655	1.0	4	ot	7		m	spent
Casey	c31	2	1	rb	3++	3	369	510	1.0	3	ot	7		f	maturing
Casey	c32	2	1	rb	4++	4	431	840	1.0	4	ot	6		m	spent
Casey	c33	2	1	rb	2++	2	280	265	1.2	2	ot	8		f	maturing
Casey	c34	2	1	rb	3++	3	290	280	1.1	3	ot	7		m	mature
Casey	c35	2	1	rb	2++	2	241	205	1.5	2	ot	7		m	mature
Casey	c36	2	1	rb	1++	1	172	51	1.0	1	ot	8		f	immature
Casey	c37	2	1	rb	1++	1	120	18	1.0	1	ot	8		u	immature

Table 6. Stock assessment data for Casey Lake in 1999 (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
Casey	1			rb		3	318	316	0.982666	3+	scale			F	mature
Casey	2			rb		3	240	140	1.012731	3+	scale			M	immature
Casey	3			rb		4	300	260	0.962963	4+	scale			F	immature
Casey	4			rb		4	352	420	0.962989	4+	scale			M	immature
Casey	5			rb		3	280	210	0.956633	3+	scale			M	immature
Casey	6			rb		3	329	340	0.954753	3+	scale			F	mature
Casey	7			rb		3	272	210	1.043548	3+	scale			M	immature
Casey	8			rb		4	325	330	0.961311	4+	scale			F	immature
Casey	9			rb		3	282	230	1.025606	3+	scale			M	immature
Casey	10			rb		4	334	360	0.966191	4+	scale			F	immature
Casey	11			rb		n/a	311	300	0.997333	n/a	scale			F	mature
Casey	12			rb		4	313	300	0.978336	4+	scale			M	immature
Casey	13			rb		4	300	280	1.037037	4+	scale			F	immature
Casey	14			rb		4	317	320	1.004551	4+	scale			F	mature
Casey	15			rb		3	290	240	0.98405	3+	scale			F	immature
Casey	16			rb		3	274	210	1.020863	3+	scale			M	immature
Casey	17			rb		3	282	230	1.025606	3	scale			F	mature
Casey	18			rb		3	259	170	0.978475	3+	scale			M	immature
Casey	19			rb		3	284	220	0.960434	3+	scale			F	immature
Casey	20			rb		2	145	29.8	0.97749	2+	scale				immature

Figure 6. Sample of the rainbow trout gill-net catch from Casey Lake in 2006.

Figure 7. Example of a mature/spawn bound rainbow trout from the gill net catch from Casey Lake in fall 2006.