Executive Summary Cobb Lake 2004

A stocking assessment was conducted on Cobb Lake in the fall of 2004. Both a standard sinking and a floating gillnet were set on September 22, 2004. A second assessment was completed on October 25, 2004 in an attempt to increase the sample size of one and two year old fish. The total sampling effort was 70.25 hours resulting in a gillnet catch per net-hour (CPUE) of 1.22 for rainbow trout, and 0.98 for eastern brook trout for both sessions. The objectives of this assessment were to document the status of the fishery and to determine the level of natural recruitment resulting from brook trout that were stocked prior to 1997. A previous assessment completed in 1998 failed to capture sufficient eastern brook trout to assess the brook trout fishery. The management objective for Cobb Lake is to maintain an average quality, high use fishery, for both brook trout and rainbow trout during the summer and winter angling periods. The results of the assessment indicate that both brook trout and rainbow trout are growing well and are reaching sizes adequate for the fishery. Rainbow trout in Cobb Lake were larger than the regional average while brook trout were near to the regional average. The mean length of rainbow trout was 379 mm with a maximum length of 468 mm; while, the mean length of eastern brook trout was 346 mm with a maximum length of 430 mm. The lack of both eastern brook trout and rainbow trout less than two years of age for both the 1998 and 2004 data is cause for some concern. There may be periodic age class failures in Cobb Lake or smaller fish may be more difficult to capture due to habitat utilization specific to the younger cohorts. Future work should investigate this problem. Eleven percent of the Cobb Lake brook trout sampled were maturing, indicating that brook trout are capable of spawning in Cobb Lake. It is recommended that a follow-up survey be completed in the future using one or two marked cohorts of sterile eastern brook trout to better understand the size of the naturalized population.
Cobb Lake also requires both summer and winter creel census/angler satisfaction surveys. These surveys will complement the proposed aerial census flights scheduled for the spring and summer of 2005. Cobb is an important lake for angling in the Omineca Region and has the potential to provide an above average angling experience; therefore, we need the additional census information to ensure that this lake is providing the desired angling experience.

Figure 1. Aerial view of Cobb Lake.

OMINECA REGION
LAKE STOCK ASSESSMENT REPORT

LAKE NAME: Cobb Lake ***ALIAS:*** Cobb ***BC WBID:*** 00654NECR

LAKE LOCATION: *Nearest center:* 49 km W Prince George *Drainage:* FRASER
UTM: 10.464289.5977825

LAKE ATTRIBUTES:

Surface Area:	210 Ha	*Elevation:*	777	m
Littoral Area:	98.1 Ha	*T.D.S.:*	105	ppm
Max Depth:	10 m	*Mean depth:*	5.9	m

MANAGEMENT OBJECTIVE:

		RB	EB
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 1998
Year(s) Surveyed: 1998

STOCKING DATA:

	Rainbow Trout			Eastern Brook Trout	
Current Stocking Rate	48	Fish/Ha	Stocking Interval	95.2	Fish/H Annually
Stock Type	**TUNKWA**			AYLMER AF3N	
Species	RB, EB				
Previous Stocking Rate	48			47.6	

SURVEY METHODS:

Method		Date (yy.mm.dd)	Survey Agency	Crew
Fish	0	2004-09-22	BCCF	Chad Robertson, Kevin Mernickle
Chem.	DO, pH	2004-10-25	BCCF	Chad Robertson, Kevin Mernickle
Physical	bathymetric	1982-10-06	MOE	Brenda Dixon
Temp.	profile	2004-10-25	BCCF	Chad Robertson, Kevin Mernickle

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

SURVEY RESULTS:

Catch

	RB	EB	RSC	LKC	LSU	CSU	NSC	CAS	BT	LT
2004	86	69	0	95	0	0	0	0	0	0
1998	40	7	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	**2004**	**1998**
Effort Hours	70.25	3.5
RB CPUE:	1.22	11.43
EB CPUE:	0.98	2.00
# of Sets:	3	1

Next Assessment **2009**

SURVEY CONCLUSIONS:

	Rainbow Objectives Achieved			Brook Trout Objectiv		
Objective	Yes	No	Reason	Yes	No	Reason
1. Family	☐	☐		☐	☐	
2. Average	☐	☐		☑	☐	
3. Above Average	☑	☐		☐	☐	
4. Trophy	☐	☐		☐	☐	

RECOMMENDATIONS:

Assessment: The next assessment should be completed in 2009.

Management: Recommended to change stocking strain to BW from NRT as there are mixed cyprinids present in Cobb Lake. Brook trout appear healthy however there may be missing age-classes. The management goal is for a moderate use winter/summer fishery. The Cobb Lake fishery appears to be meeting this management objective.
Recommend two cohorts (brood request years 2006,2007) of marked EB just prior to the next stocking assessment. (2009)

Comments: In 1998 it was noted that rainbow trout were in poorer condition in Cobb Lake when compared to other lakes in the region. In 2004 there is a noticeable increase in the length to weight relationship suggesting that the rainbow trout are experiencing better conditions for growing.

Eleven percent (5 fish of 43 sampled) of the 2004 EB catch was comprised of diploids, indicting some naturalzed recruitment.

Uncertainties: The lack of any number of fish in the sample composed of age 1 and age 2 for both the 1998 and 2004 data is cause for some concern. There may be periodic age class failures in Cobb Lake or smaller fish may be more difficult to capture due to habitat utilization specific to the younger cohorts. The 1998 data may also be explained because the net-set location was near the creek mouth where the sampling crew was reportedly targeting older mature fish. Comments on the maturity of fish sampled was not recorded, which has resulted in uncertainty in the assesment of the number of diploid brook trout present in Cobb Lake.

Recent Brood Request Comments:

2005 RB Annual. Changed stock to BW- mixed cyprinids present (no NPM- was NRT). Assessed '04- Good RB growth no other changes until data review complete.

2005 EB Annual. Assessed '04. Excellent growth- may have missing cohorts. Limited natural recruitment.

History of Angling Regulations

There are no special angling regulations for Cobb Lake.

Reported by: Adrian Clarke
Date: Feb-05

Table 1. RB and EB 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
Rainbow Trout															
2004	1	1	149				35				1.06				
1998	2	3	301.667	286	314	14.3	302	270	350	42.5	1.10	1.00	1.15	0.1	0.01
2004	3	7	341.143	222	390	60.2	446	120	600	173.2	1.06	0.98	1.29	0.1	0.01
1998	3	11	372.364	342	439	25.2	509	400	755	95.6	0.98	0.85	1.06	0.1	0.01
2004	4	10	390.1	355	422	18.8	640	520	800	91.7	1.08	0.91	1.23	0.1	0.01
1998	4	16	411.5	391	453	15.8	691	530	910	110.3	0.99	0.77	1.12	0.1	0.01
2004	5	6	405.667	376	438	20.7	752	670	810	59.5	1.13	0.95	1.26	0.1	0.01
1998	5	10	420.1	396	456	18.0	743	585	915	102.8	1.00	0.81	1.17	0.1	0.01
2004	6	1	412				800				1.14				
Eastern Brook Trout															
2004	2	22	305.864	275	327	14.0	330	222	422	56.6	1.15	0.96	1.53	0.1	0.02
2004	3	16	370.563	331	402	19.7	629	460	885	116.7	1.22	1.06	1.36	0.1	0.01
2004	4	5	402.8	374	430	22.9	843	605	1020	154.3	1.28	1.16	1.43	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
Rainbow Trout														
2004	52	379	149	468	54.8	667	35	1200	230.7	1.16	0.85	1.56	0.16	0.02
1998	40	395	286	456	54.8	625	270	915	163.4	1.00	0.77	1.17	0.10	0.01
Brook Trout														
2004	58	346	275	430	42.0	537	222	1200	222.2	1.23	0.96	1.60	0.15	0.02
1998	7	319	241	384	42.0	449	195	770	232.4	1.28	1.11	1.39	0.11	0.01

Table 3. Proportion of Catch (by survey year)

Survey Year	2004		1998	
Rainbow Trout				
Less than 250 mm	5.8	%	0.0	%
Between 250-350 mm	9.6	%	10.0	%
Between 250-400 mm	59.6	%	42.5	%
Greater than 400 mm	34.6	%	57.5	%
Greater than 500 mm	0.0	%	0.0	%
Eastern Brook Trout				
Less than 250 mm	0.0	%	14.3	%
Between 250-350 mm	48.3	%	42.9	%
Between 250-400 mm	75.9	%	85.7	%
Greater than 400 mm	10.3	%	0.0	%
Greater than 500 mm	0.0	%	0.0	%

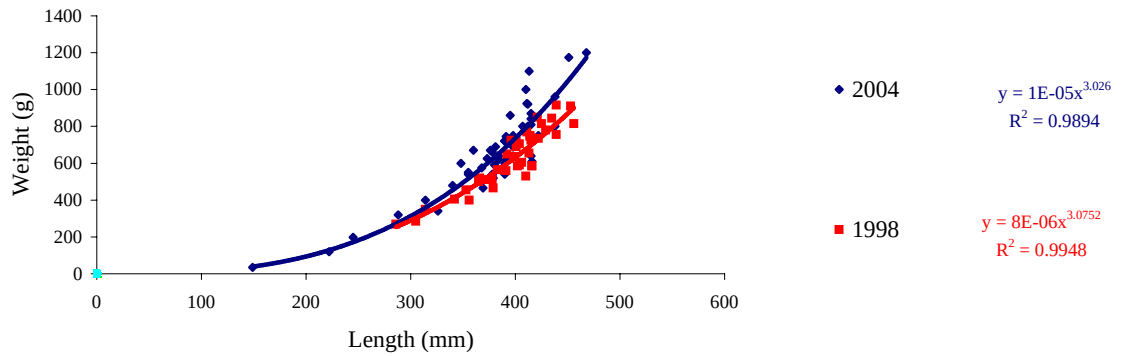

Figure 2. Length weight power relationship for rainbow trout.

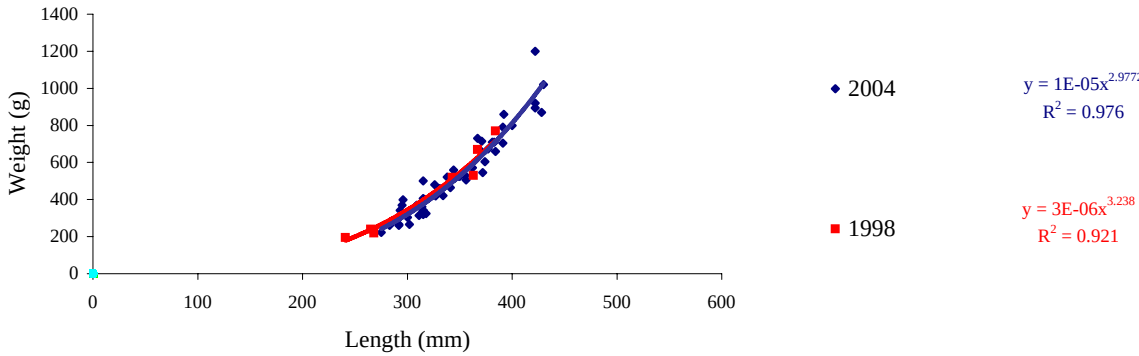

Figure 3. Length weight power relationship for eastern brook trout.

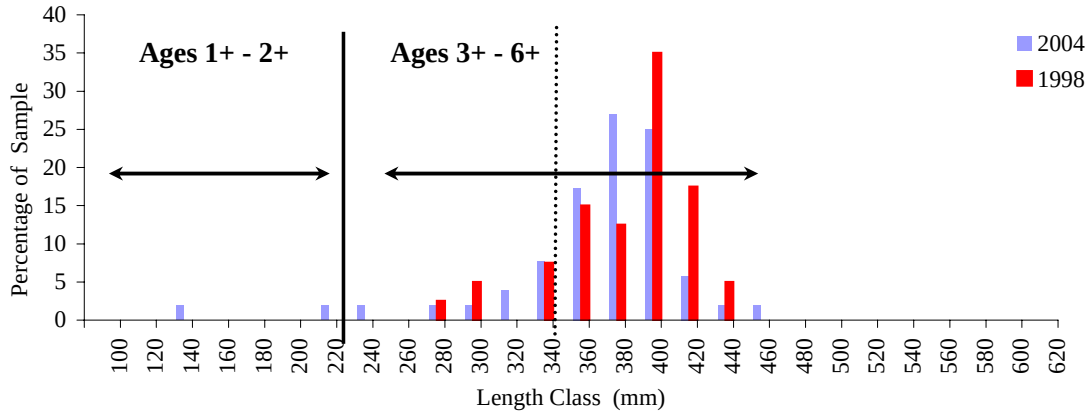

Figure 4. Length frequency distribution for rainbow trout. Age brackets apply to 2004 data. Dashed line indicates approximate 3+ age class.

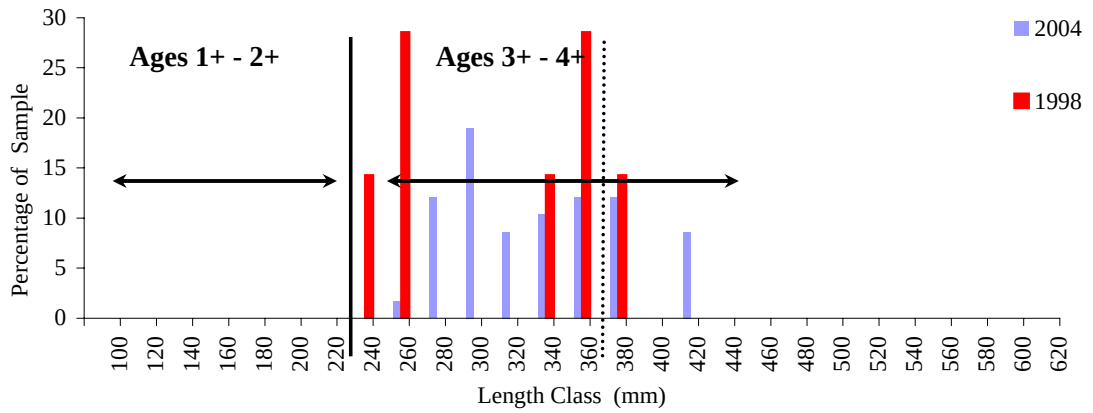

Figure 5. Length frequency distribution for brook trout. Age brackets apply to 2004 data. Dashed line indicates approximate 3+ age class.

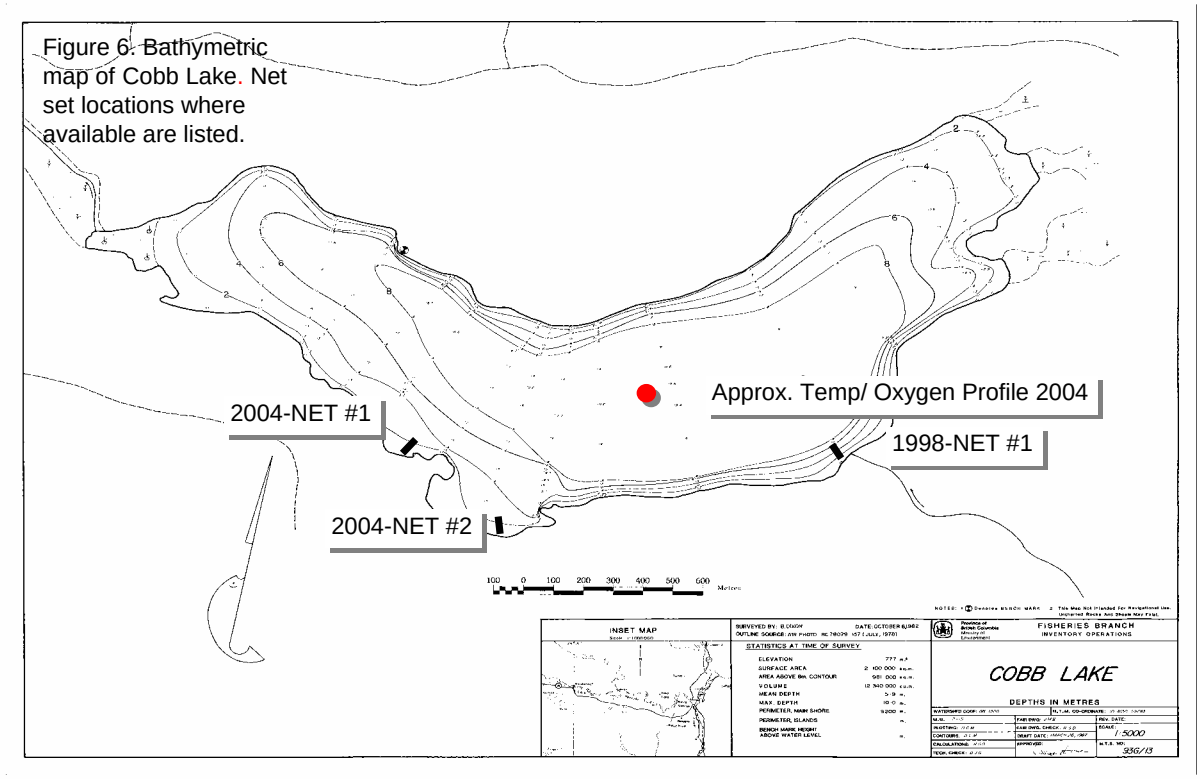

Figure 6. Bathymetric map of Cobb Lake. Net set locations where available are listed.

Table 4. Stocking History for Cobb lake to 2004.

Rainbow Trout Release Date	Species	Fish Count	Stock	Mark	Average	Life Cycle
1-Jun-04	RB	10000	TUNKWA		9.02	YEARLING
11-Jun-03	RB	10000	BADGER TUNKWA		10.17	YEARLING
18-Jun-02	RB	10000	TZENZAICUT DR		25.32	YEARLING
30-May-01	RB	10000	NRT DRAGON		9.52	YEARLING
30-May-00	RB	10000	NRT PREMIER		9.9	YEARLING
1-Jun-99	RB	10000	PENNASK		6.52	YEARLING
28-May-98	RB	10000	BADGER TUNKWA		7.75	YEARLING
16-Jun-97	RB	10000	BADGER TUNKWA		7.78	YEARLING
30-May-96	RB	10000	BADGER TUNKWA		5.32	YEARLING
10-Jun-95	RB	3690	NRT GENIER		12.58	YEARLING
10-Jun-95	RB	6310	TUNKWA GE		7.81	YEARLING
12-Jun-94	RB	10000	TUNKWA		7.46	YEARLING
30-May-93	RB	10000	TUNKWA		2.94	YEARLING
17-Jun-92	RB	10000	NRT PREMIER		9.01	YEARLING
22-May-91	RB	10000	BADGER		16.1	YEARLING
23-Jun-90	RB	6388	NRT PREMIER		6.6	YEARLING
11-Jun-90	RB	3612	BADGER		16.6	YEARLING
13-Jun-89	RB	3358	NRT PREMIER		6.5	YEARLING
7-Jun-89	RB	6642	TUNKWA		8.1	YEARLING
1-May-88	RB	10000	TUNKWA		9.9	UNKNOWN
1-May-87	RB	10000	TUNKWA		15.6	UNKNOWN
1-May-86	RB	7500	NRT PREMIER		3	UNKNOWN

Eastern Brook Trout Release Date	Species	Fish Count	Stock	Mark	Average	Life Cycle
1-Jun-04	Brook Trout	20000	AYLMER AF3N		7	FINGERLING
11-Jun-03	Brook Trout	20000	AYLMER AF3N		6.59	FINGERLING
14-Jun-02	Brook Trout	20000	AYLMER AF3N		10.04	FINGERLING
11-Jun-01	Brook Trout	11000	AYLMER AF3N		8.49	FINGERLING
5-Jun-01	Brook Trout	9434	AYLMER AF3N		7.84	FINGERLING
30-May-00	Brook Trout	20000	AYLMER AF3N		4.78	FINGERLING
1-Jun-99	Brook Trout	20000	AYLMER AF3N		5.9	FINGERLING
28-May-98	Brook Trout	20000	AYLMER 3N		4.26	FINGERLING
16-Jun-97	Brook Trout	12500	AYLMER		3.01	FINGERLING
30-May-96	Brook Trout	20000	AYLMER 3N		3.61	FINGERLING
10-Jun-95	Brook Trout	20000	AYLMER		4.02	FINGERLING
12-Jun-94	Brook Trout	20000	AYLMER		3.81	FINGERLING
11-Jun-93	Brook Trout	3000	AYLMER		4.37	FINGERLING
30-May-93	Brook Trout	16936	AYLMER		3.42	FINGERLING
17-Jun-92	Brook Trout	20000	AYLMER		3.25	FINGERLING
22-May-91	Brook Trout	20000	AYLMER		2.26	FINGERLING
23-Jun-90	Brook Trout	8050	AYLMER		4.4	FINGERLING
11-Jun-90	Brook Trout	11950	AYLMER		4.2	FINGERLING
15-Jun-89	Brook Trout	8429	AYLMER		2.5	FRY
7-Jun-89	Brook Trout	11571	AYLMER		2.5	FRY
1-Jun-88	Brook Trout	25000	AYLMER		2.5	UNKNOWN
1-Jul-87	Brook Trout	15000	AYLMER		2.1	UNKNOWN
1-Jun-86	Brook Trout	31000	AYLMER		1.5	UNKNOWN
1-Jun-85	Brook Trout	10000	AYLMER		2.4	UNKNOWN
1-May-84	Brook Trout	40000	AYLMER		3.7	UNKNOWN

Table 5. Dissolved Oxygen/ Temperature Profile

26-Oct-04 Station UTM 10.463349.5978537

Depth (m)	DO mg/L	DO %sat	Temp. ^{0}C	pH	Cond (25^{o}C)
0	9.38	75.3	6.04	7.5	113
1	9.62	77.3	6.06	7.8	113
2	9.94	80.1	6.05	7.8	113
3	10.21	82.0	5.93	7.9	113
4	10.14	81.7	6.06	7.9	113
5	10.26	82.1	6.01	7.9	114
6	10.43	83.8	6	7.9	114
7	10.57	84.9	5.99	7.9	114
8	10.52	84.6	5.99	7.8	115
9	9.56	76.7	6.51	7.6	118
10	7.24	65.6	6.52	7.4	137

Table 6. 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	Clip	Sex	Maturity	Ageing Comments
Cobb	1	2	RB	5	409	790	1.2	5+	OT	UN	F	MT	
Cobb	2	2	RB	4	398	640	1.0	4+	OT	UN	F	ST	
Cobb	3	2	RB	3	326	340	1.0	3+	OT	UN	F	IM	translucent
Cobb	4	2	RB	4	355	550	1.2	4+	OT	UN	M	M	
Cobb	5	2	RB	4	390	540	0.9	4+	OT	UN	F	MT	translucent
Cobb	6	2	RB		384	620	1.1	n/a	OT	UN	F	IM	translucent, unreadable; at least 3+
Cobb	7	2	RB	5	376	670	1.3	5+	OT	UN	F	MT	
Cobb	8	2	RB	3	222	120	1.1	3+	OT	UN	F	IM	originally sample #9, switched to #8
Cobb	9	2	RB	1	149	35	1.1	1++	OT	UN	F	IM	originally sample #8, switched to #9
Cobb	10	2	RB	4	422	750	1.0	4+	OT	UN	F	MT	translucent; vague 1st annulus
Cobb	11	2	RB	4	391	620	1.0	4+	OT	UN	F	MT	translucent
Cobb	12	2	RB	4	384	640	1.1	4+	OT	UN	M	MT	
Cobb	13	2	RB	3	314	400	1.3	3+	OT	UN	F	MT	translucent
Cobb	14	2	RB	3	390	600	1.0	3+	OT	UN	F	MT	translucent
Cobb	15	2	RB	4	379	520	1.0	4+	OT	UN	F	MT	translucent
Cobb	16	2	RB		369	465	0.9	n/a	OT	UN	M	M	translucent, unreadable; estimate 3+ or 4+
Cobb	17	2	RB	4	373	625	1.2	4+	OT	UN	F	MT	translucent
Cobb	18	1	RB	4	407	800	1.2	4+	OT	UN	M	M	
Cobb	19	1	RB	5	438	800	1.0	5+	OT	UN	F	ST	
Cobb	20	1	RB	5	398	750	1.2	5+	OT	UN	F	ST	
Cobb	21	1	RB	5	415	810	1.1	5+	OT	UN	F	MT	
Cobb	22	1	RB	5	398	690	1.1	5+	OT	UN	F	MT	
Cobb	23	1	RB	3	378	540	1.0	3+	OT	UN	M	M	
Cobb	24	1	RB	4	402	710	1.1	4+	OT	UN	F	ST	vague 1st annulus
Cobb	25	1	RB	3	380	590	1.1	3+	OT	UN	F	ST	
Cobb	26	1	RB		415	870	1.2	n/a	OT	UN	F	MT	translucent, unreadable; at least 4+
Cobb	27	1	RB	6	412	800	1.1	6+	OT	UN	F	MT	
Cobb	28	1	RB	3	378	530	1.0	3+	OT	UN	F	MT	
Cobb	29	1	RB		390	720	1.2	n/a	OT	UN	F	MT	translucent, unreadable; at least 3+
Cobb	30	1	RB		416	610	0.8	n/a	OT	UN	M	MT	translucent, unreadable; at least 3+
Cobb	31	1	EB	4	430	1020	1.3	4+	OT	UN	AF3N		
Cobb	32	1	EB	4	422	920	1.2	4+	OT	UN	AF3N		
Cobb	33	1	EB	2	308	365	1.2	2+	OT	UN	AF3N		
Cobb	34	1	EB	3	384	660	1.2	3+	OT	UN	AF3N		
Cobb	35	1	EB	3	355	530	1.2	3+	OT	UN	AF3N		
Cobb	36	1	EB	2	302	265	1.0	2+	OT	UN	AF3N		
Cobb	37	1	EB	3	400	800	1.3	3+	OT	UN	AF3N		translucent; age checked due to fish size
Cobb	38	1	EB	3	362	572	1.2	3+	OT	UN	AF3N		
Cobb	39	1	EB	2	300	303	1.1	2+	OT	UN	AF3N		
Cobb	40	1	EB	3	383	710	1.3	3+	OT	UN	AF3N		translucent
Cobb	41	1	EB	4	392	860	1.4	4+	OT	UN	F	ST	translucent
Cobb	42	1	EB	2	283	260	1.1	2+	OT	UN	AF3N		
Cobb	43	1	EB	3	391	704	1.2	3+	OT	UN	AF3N		
Cobb	44	1	EB	2	292	260	1.0	2+	OT	UN	AF3N		
Cobb	45	1	EB	2	315	342	1.1	2+	OT	UN	AF3N		
Cobb	46	1	EB	4	374	605	1.2	4+	OT	UN	AF3N		age checked due to fish size
Cobb	47	1	EB	2	296	398	1.5	2+	OT	UN	F	ST	
Cobb	48	1	EB	3	350	525	1.2	3+	OT	UN	AF3N		
Cobb	49	1	EB	3	381	710	1.3	3+	OT	UN	AF3N		
Cobb	50	1	EB	2	309	370	1.3	2+	OT	UN	AF3N		
Cobb	51	1	EB	3	369	670	1.3	3+	OT	UN	AF3N		
Cobb	52	1	EB	2	314	360	1.2	2+	OT	UN	AF3N		
Cobb	53	1	EB	3	331	460	1.3	3+	OT	UN	AF3N		age checked due to fish size
Cobb	54	1	EB	3	348	525	1.2	3+	OT	UN	AF3N		
Cobb	55	1	EB	3	372	545	1.1	3+	OT	UN	AF3N		
Cobb	56	1	EB	2	275	222	1.1	2+	OT	UN	AF3N		
Cobb	57	1	EB	2	293	342	1.4	2+	OT	UN	F	ST	
Cobb	58	1	EB	3	356	505	1.1	3+	OT	UN	AF3N		
Cobb	59	1	EB	2	318	325	1.0	2+	OT	UN	AF3N		
Cobb	60	1	EB	2	315	340	1.1	2+	OT	UN	AF3N		
Cobb	61	1	EB	2	327	420	1.2	2+	OT	UN	AF3N		
Cobb	62	1	EB	2	311	315	1.0	2+	OT	UN	AF3N		
Cobb	63	1	EB	2	325	422	1.2	2+	OT	UN	AF3N		
Cobb	64	1	EB	2	322	325	1.0	2+	OT	UN	AF3N		
Cobb	65	2	EB	2	298	360	1.4	2+	OT	UN	F	ST	
Cobb	66	2	EB	3	379	670	1.2	3+	OT	UN	AF3N		
Cobb	67	2	EB	3	402	885	1.4	3+	OT	UN	AF3N		age checked due to fish size
Cobb	68	2	EB	3	366	600	1.2	3+	OT	UN	AF3N		
Cobb	69	2	EB	4	396	810	1.3	4+	OT	UN	AF3N		
Cobb	70	2	EB	2	298	270	1.0	2+	OT	UN	AF3N		
Cobb	71	2	EB	2	321	410	1.2	2+	OT	UN	M	M	
Cobb	72	2	EB	2	292	265	1.1	2+	OT	UN	AF3N		
Cobb	73	2	EB	2	315	320	1.0	2+	OT	UN	AF3N		
Cobb	1	1	EB		367	730	1.5						
Cobb	2	1	EB		422	895	1.2						
Cobb	3	1	EB		371	715	1.4						
Cobb	4	1	EB		334	422	1.1						
Cobb	5	1	EB		341	465	1.2						
Cobb	6	1	EB		338	522	1.4						
Cobb	7	1	EB		422	1200	1.6						
Cobb	8	1	EB		391	790	1.3						
Cobb	9	1	EB		315	405	1.3						
Cobb	10	1	EB		326	480	1.4						
Cobb	11	1	EB		428	870	1.1						
Cobb	12	1	EB		377	674	1.3						
Cobb	13	1	EB		344	560	1.4						
Cobb	14	1	EB		315	500	1.6						
Cobb	15	1	EB		295	370	1.4						
Cobb	16	1	RB		413	1100	1.6						
Cobb	17	1	RB		381	690	1.2						
Cobb	18	1	RB		410	1000	1.5						
Cobb	19	1	RB		348	600	1.4						
Cobb	20	1	RB		390	720	1.2						
Cobb	21	1	RB		415	840	1.2						
Cobb	22	1	RB		411	924	1.3						
Cobb	23	1	RB		360	670	1.4						
Cobb	24	1	RB		468	1200	1.2						
Cobb	25	1	RB		415	640	0.9						
Cobb	26	1	RB		288	320	1.3						
Cobb	27	1	RB		451	1175	1.3						
Cobb	28	1	RB		378	660	1.2						
Cobb	29	1	RB		391	745	1.2						
Cobb	30	1	RB		438	960	1.1						
Cobb	31	1	RB		245	198	1.3						
Cobb	32	1	RB		412	920	1.3						
Cobb	33	1	RB		395	860	1.4						
Cobb	34	1	RB		355	540	1.2						
Cobb	35	1	RB		390	720	1.2						
Cobb	36	1	RB		368	575	1.2						
Cobb	37	1	RB		340	480	1.2						