

**Chenik Lake
Progress Report
2007**

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This year's operation of the Chenik Lake Project was made possible through enhancement taxes paid by the commercial fishermen in Area H, Cook Inlet and associated waters and a grant provided by Senator Ted Stevens administered through the National Oceanic and Atmospheric Administration and the Alaska Department of Fish and Game.

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DISCLAIMER

The Cook Inlet Aquaculture Association conducts salmon enhancement and restoration projects in area H, Cook Inlet and associated waters. As an integral part of these projects a variety of monitoring and evaluation studies are conducted. The following progress report is a synopsis of the monitoring and evaluation studies conducted for the Chenik Lake project.

The purpose of the progress report is to provide a vehicle to distribute the information produced by the monitoring and evaluation studies. Data collected each year are presented with a summary of the information previously collected for comparative purposes. These reports are intended to provide a general description of project activity and are not an exhaustive evaluation of any restoration or enhancement project. The information presented in this report has not undergone an extensive review. As reviews are completed, the information may be updated and presented in later progress reports.

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ACKNOWLEDGEMENTS

Many individuals and agencies contributed to the success of the Chenik Lake Project in 2007. Appreciation is extended to Cook Inlet Aquaculture Association seasonal field assistants, Kevin Lauscher and Max Bader; and to the full-time staff who assisted in the project. Appreciation is also extended to the Alaska Department of Fish and Game in Homer for the support they provided during this project.

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ABSTRACT

The 2007 Chenik Lake project was a collaborative effort between the Cook Inlet Aquaculture Association (CIAA) and the Alaska Department of Fish and Game (ADF&G). This was the third year CIAA monitored the Chenik Lake escapement by use of weir. The weir was used to provide timely information to ADF&G for critical management decisions, as well as to compare with data collected from the video count conducted by ADF&G. During CIAA and ADF&G monitoring efforts from 22 June through 24 August, an estimated total adult sockeye salmon escapement was 18,312.

ADF&G monitored Chenik Creek by video recording from 22 June to 14 August 2007. The total video count during these two periods was 17,529 adult sockeye salmon.

CIAA monitored Chenik Creek by use of weir from 28 June to 6 August 2007. During this period, 17,431 adult sockeye salmon returned to Chenik Creek. Adult sockeyes were proportionally sampled for sex, age and size class as they ascended Chenik Creek. Based on scale samples collected, the average adult sockeye population was 507 mm. The average male length was 519 mm, and the average female length was 490 mm. The percentage of adult male and adult female sockeye salmon returning to Chenik Creek in 2007 was 57% and 43%, respectively. An estimated, 65.8% of the population was age 1.2, 32.6% were age 1.3, and 1.5% were age 2.3.

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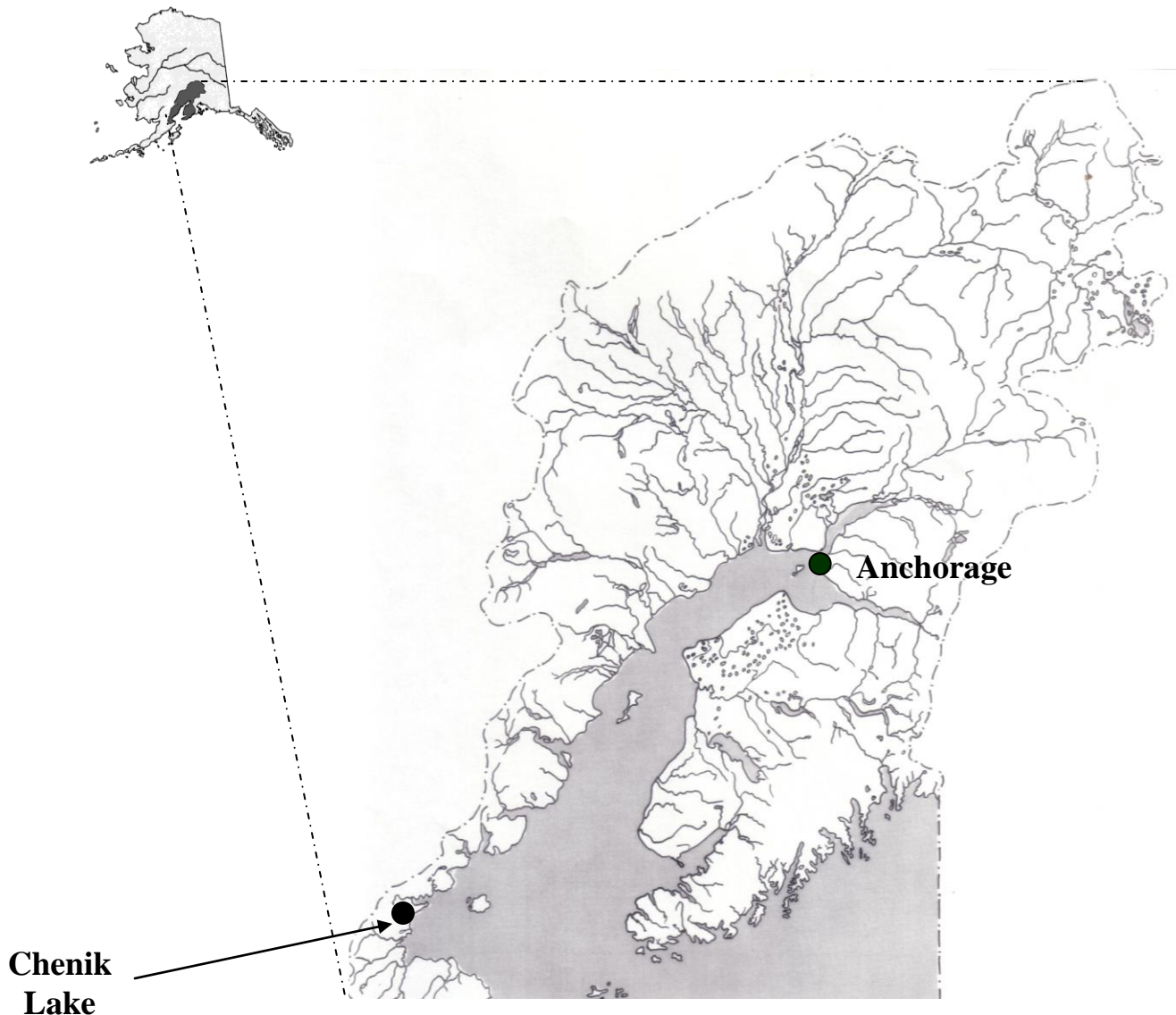
INTRODUCTION AND PURPOSE

The goal of the Cook Inlet Aquaculture Association (CIAA) is to protect and rehabilitate self-perpetuating salmon stocks and their habitats through sound science and enhancement technology. In 2005 CIAA acquired a grant through the Pacific Coast Salmon Recovery Fund to monitor adult salmon populations. CIAA approached the Alaska Department of Fish and Game (ADF&G) Area Management Biologists and requested identification of the systems which they wanted escapement information. Chenik Lake was identified as a high priority for research because its sockeye salmon population was recovering from a suspected IHNV virus outbreak (IHNV was confirmed in 1991-93 *see Appendix 3*). In addition to the recovering sockeye population Chenik Lake also offered the opportunity to compare escapement counts between ADF&G's video recorder enumeration system and a more traditional adult salmon counting weir. Daily weir counts also provided timely information for critical management decisions.

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PROJECT AREA

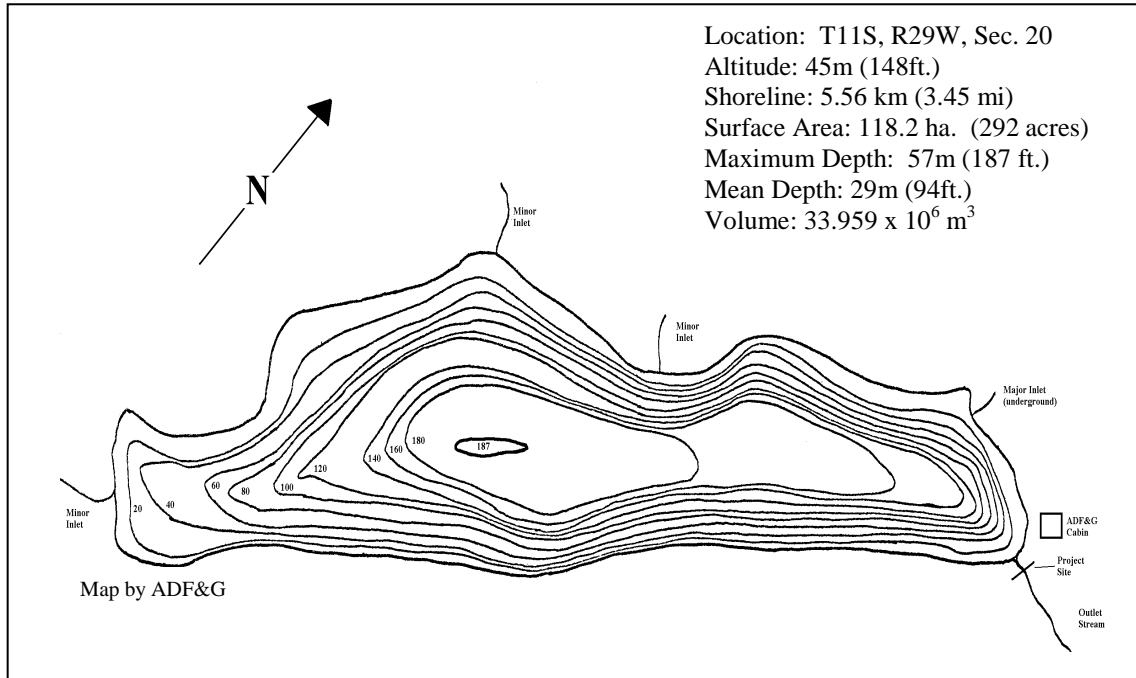
Chenik Lake is located on the west side of lower Cook Inlet approximately 338 kilometers SSW of Anchorage (Figure 1). The land is characterized by rolling foothills (Figure 2) of the Aleutian Range and is generally less than 1,433 meters in elevation (Division of Habitat and Restoration and Wildlife Conservation 1996). The vegetation is low consisting of grasses, alders (*Alnus* spp.) and willows (*Salix* spp.). The lake covers 118.2 ha, has a maximum depth of 57m, a mean depth of 29m, 5.6 km shoreline and is located at an elevation of 42m above sea level (Figure 3).



(Figure 1) Chenik Lake in relation to Cook Inlet and Alaska



(Figure 2) Chenik Lake low vegetation and rolling foothills



(Figure 3) Hydrographic map of Chenik Lake

METHODS

Environmental Conditions

Percent Cloud Cover was visually estimated, precipitation measured to the nearest millimeter, air temperature (°C) and Chenik Creek water temperature (°C) were recorded at 5:00 PM each day. Standard CIAA procedures from the Chenik Lake Procedures Manual were followed for collecting these measurements (CIAA, 2005).

Adult Escapement

To enumerate returning salmon and assess the sex, age, and standard fork length¹ of the returning population of fish, an adult counting weir was temporarily installed in Chenik Creek. The weir was constructed of 1.9 cm galvanized pipe and 7.6 cm aluminum channel. The galvanized pipe was picketed through 1.9 cm holes in the aluminum channel spaced 2.54 cm apart.

By removing one or two pickets fish were permitted to pass through the weir. Field personnel counted the adult fish as they ascended Chenik Creek. Initially counts were made at least twice a day. As the number of fish ascending Chenik Creek increased, counts were made more frequently. Fish were never allowed to accumulate behind the weir.

To assure a representative sample of fish were collected for assessing age, sex and size, every 20th fish was collected throughout the migration. The fish were temporarily held, sexed, measured for length, a scale was collected for age determination, and released upstream. A total of 885 adult sockeyes were collected and measured.

¹ Standard fork length is defined as the measurement from mid-eye to the fork of the tail

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RESULTS AND DISCUSSION

Environmental Conditions

Environmental conditions during the Chenik Lake adult sockeye migration were monitored from 28 June to 5 August 2007. Stream stage measurements averaged 0.95 feet and ranged from 0.82 to 1.14 feet. Stream temperatures averaged 12°C and ranged from 7 to 16°C and air temperatures averaged 14°C and ranged from 9 to 22°C. Three percent of the days were clear, 49% were partly cloudy, and 49% were completely overcast. Rain was recorded on 17 of the days during the adult migration. A total of 117 mm of rain fell during this period (Appendix 1).

Adult Escapement

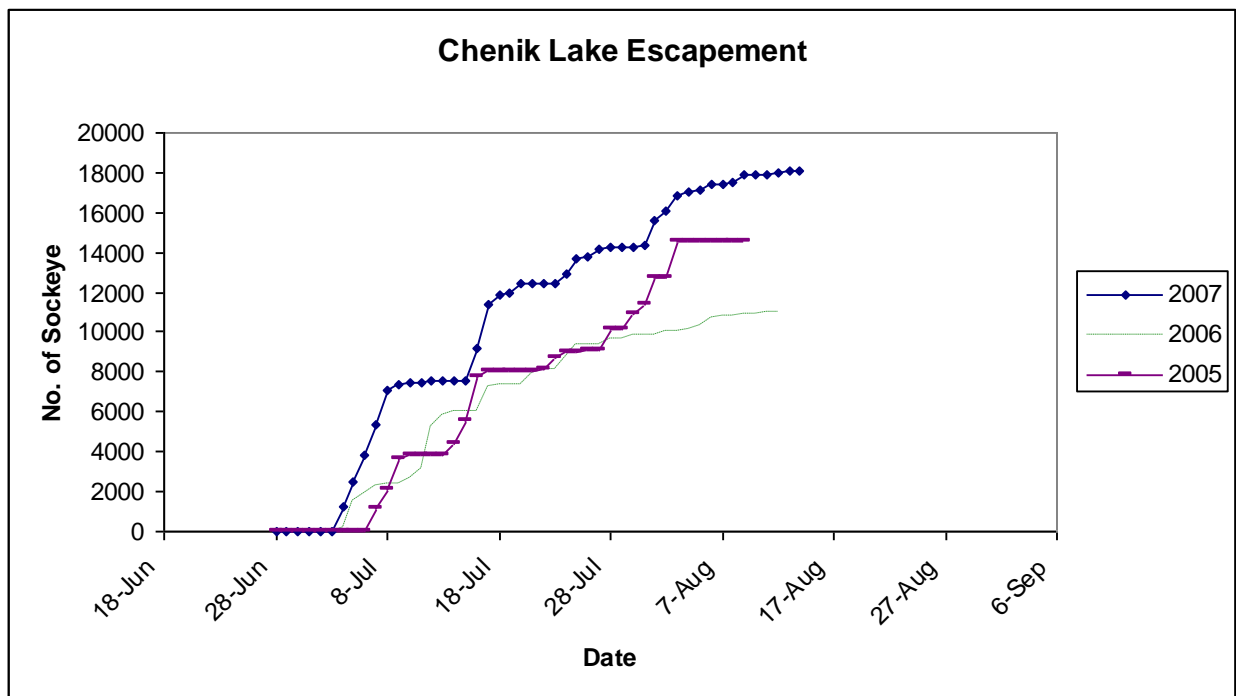
The 2007 CIAA weir count in Chenik Creek was enumerated from 28 June to 6 August. During this time, a total of 17,431 adult sockeye salmon escaped into Chenik Lake. ADF&G video count was available from 22 June to 14 August 2007. A video count comparison with the weir count was made from 28 June to 6 August the count was 17,529 (video) and 17,431 (weir), a 98 fish difference. The video count and the weir count were combined to estimate the total adult sockeye salmon escapement of 18,132 (Appendix 2).

Based on scale samples collected, the percentage of adult male and adult female sockeye salmon returning to Chenik Lake in 2007 was 57% and 43%, respectively. The average adult sockeye population was 507 mm. Males averaged 519 mm in length and females averaged 490 mm. An estimated 65.8% of the fish were age 1.2, 32.6% were age 1.3, and 1.5% were 2.3 (Table 1).

Table 1. Chenik Lake sockeye salmon escapement and adult characteristics.

Year	Escapement		Sex Class		Age Classes							
	weir count	weir & video combined count	male (%)	female (%)	1.2		1.3		2.2		2.3	
					(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)
2005	12,775	14,507	50.6	49.4	1.5	489	96.8	536	0.2	495	1.5	538
2006	8,514	10,961	55.5	44.5	90.6	485	5.2	537	3.1	499	1.0	539
2007	17,431	18,132	57.2	42.8	65.8	486	32.6	548	0	0	1.5	554
Mean	12,907	14,533	54	46	53	487	45	540	1	331	1	544
Min	8,514	10,961	51	43	2	485	5	536	0	0	1	538
Max	17,431	18,132	57	49	91	489	97	548	3	499	2	554

Table2. Chenik Lake adult salmon escapement



RECOMMENDATIONS

The Cook Inlet Aquaculture Association as well as Alaska Department of Fish and Game Homer office recommends the monitoring continue in 2008.

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LITERATURE CITED

Division of Habitat and Restoration and Wildlife Conservation 1996. McNeal River State Game Refuge and State Game Sanctuary Management Plan. Alaska Department of Fish and Game 333 Raspberry Rd. Anchorage, AK 99518-1599.

http://wildlife.alaska.gov/management/planning/planning_pdfs/mcneil_river_plan.pdf

CIAA 2005. Chenik Lake Procedures Manual. Cook Inlet Aquaculture Association 40610 Kalifornsky Beach Road Kenai, Alaska 99611, 25 pp.

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APPENDICES

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Appendix 1. Chenik Lake 2007 – Environmental Conditions.

Date	Sky	Precip. (mm)	Stage (ft)	Flow	Water Temp. (°C)	Air Temp. (°C)
28-Jun	3	0	1.14	ND	7	12
29-Jun	3	0	1.12	ND	10	14
30-Jun	4	0	1.1	ND	10	12
1-Jul	4	0	1.08	ND	12	16
2-Jul	3	0	1.05	ND	12	15
3-Jul	2	0	1.02	ND	13	15
4-Jul	3	0	1.02	ND	10	15
5-Jul	5	0	0.97	ND	11	10
6-Jul	2	2	0.98	ND	10	15
7-Jul	2	0	0.96	ND	11	16
8-Jul	3	9	0.96	ND	11	11
9-Jul	4	1	0.95	ND	11	12
10-Jul	4	0	0.94	ND	11	12
11-Jul	2	0	0.93	ND	12	15
12-Jul	3	1	0.92	ND	12	13
13-Jul	4	7	0.92	ND	12	12
14-Jul	4	0	0.90	ND	11	11
15-Jul	3	0	0.91	ND	16	14
16-Jul	2	0	0.88	ND	14	17
17-Jul	4	0	0.86	ND	12	11
18-Jul	4	9	0.88	ND	12	12
19-Jul	3	5	0.88	ND	13	17
20-Jul	3	9	0.89	ND	15	21
21-Jul	3	0	0.87	ND	14	15
22-Jul	5	10	0.89	ND	14	9
23-Jul	4	3	0.88	ND	12	10
24-Jul	5	20	0.93	ND	11	10
25-Jul	5	10	0.99	ND	11	14
26-Jul	4	1	0.99	ND	13	14
27-Jul	3	0	0.98	ND	13	17
28-Jul	1	0	0.96	ND	14	20
29-Jul	2	0	0.97	ND	15	22
30-Jul	2	0	0.92	ND	14	17
31-Jul	4	0	0.90	ND	12	11
1-Aug	4	0	0.82	ND	12	11
2-Aug	4	14	0.88	ND	12	11
3-Aug	4	0	0.87	ND	11	11
4-Aug	4	17	0.93	ND	11	11
5-Aug	3	0	1.01	ND	13	16
Total		117				
Avg.		3	0.95	ND	12	14
Min.		0	0.82	ND	7	9
Max.		20	1.14	ND	16	22

Ice out = ND

Summary of Cloud Cover - Percent of Days

	No. Days	Meas.		Partly	
		Rain	Overcast	Cloudy	Clear
Adults	39	44%	49%	49%	3%

1.0 = Clear
 2.0 = Cloud Cover <50%
 3.0 = Cloud Cover >50%
 4.0 = Overcast
 5.0 = Rain

ND = No Data

Appendix 2. Chenik Lake 2007 – Daily Sockeye Escapement.

Date	Weir Escapement		Video	Total
	Daily	Total	Count	
22-Jun			0	0
23-Jun			0	0
24-Jun			0	0
25-Jun			0	0
26-Jun			0	0
27-Jun			0	0
28-Jun	0	0		0
29-Jun	0	0		0
30-Jun	0	0		0
1-Jul	0	0		0
2-Jul	1	1		1
3-Jul	34	35		35
4-Jul	1,186	1,221		1,221
5-Jul	1,253	2,474		2,474
6-Jul	1,389	3,863		3,863
7-Jul	1,523	5,386		5,386
8-Jul	1,743	7,129		7,129
9-Jul	250	7,379		7,379
10-Jul	55	7,434		7,434
11-Jul	0	7,434		7,434
12-Jul	125	7,559		7,559
13-Jul	2	7,561		7,561
14-Jul	7	7,568		7,568
15-Jul	12	7,580		7,580
16-Jul	1,564	9,144		9,144
17-Jul	2,248	11,392		11,392
18-Jul	510	11,902		11,902
19-Jul	17	11,919		11,919
20-Jul	504	12,423		12,423
21-Jul	0	12,423		12,423
22-Jul	0	12,423		12,423
23-Jul	0	12,423		12,423
24-Jul	531	12,954		12,954
25-Jul	742	13,696		13,696
26-Jul	116	13,812		13,812
27-Jul	352	14,164		14,164
28-Jul	129	14,293		14,293
29-Jul	0	14,293		14,293
30-Jul	0	14,293		14,293
31-Jul	69	14,362		14,362
1-Aug	1,246	15,608		15,608
2-Aug	447	16,055		16,055
3-Aug	763	16,818		16,818
4-Aug	209	17,027		17,027
5-Aug	148	17,175		17,175
6-Aug	256	17,431		17,431
7-Aug			16	17,447
8-Aug			111	17,558
9-Aug			360	17,918
10-Aug			14	17,932
11-Aug			1	17,933
12-Aug			57	17,990
13-Aug			82	18,072
14-Aug			60	18,132
Total		17,431		18,132

Appendix 3. Chenik Lake 2007 – Chenik Lake Historic Escapement

Year	Date	Escapement	Harvest	Total Return	Area Surveyed	Remarks
1927		7,069	0	7,069	Chenik Creek/Lake	
1928		31,007	0	31,007	Chenik Creek/Lake	
1929		30,440	0	30,440	Chenik Creek/Lake	
1930		24,172	53,444	24,172	Chenik Creek/Lake	
1931		33,514	0	33,514	Chenik Creek/Lake	
1932		53,012	100,000	153,012	Chenik Creek/Lake	
1933		39,222	0	39,222	Chenik Creek/Lake	
1934		35,778	0	35,778	Chenik Creek/Lake	
1935		16,041	0	16,041	Chenik Creek/Lake	
1936		19,349	0	19,349	Chenik Creek/Lake	
1937		8,256	0	8,256	Chenik Creek/Lake	
1938		3,804	0	3,804	Chenik Creek/Lake	
1939		4,076	0	4,076	Chenik Creek/Lake	
1940-46		ND	0	ND	Chenik Creek/Lake	No Data/Survey
1947		1,000	0	1,000	Chenik Creek/Lake	Fisherman Report
1948		ND	0	ND	Chenik Creek/Lake	No Data/Survey
1949		2,254	0	2,254	Chenik Creek/Lake	Aerial/ ground survey
1950-54		ND	0	ND	Chenik Creek/Lake	No survey
1955		175	0	175	Chenik Creek/Lake	Aerial
1956		3,000	0	3,000	Chenik Creek/Lake	Aerial
1957		1,800	0	1,800	Chenik Creek/Lake	Ground Survey
1958		200	0	200	Chenik Creek/Lake	Aerial
1959		ND	0	ND	Chenik Creek/Lake	ND
1960		800	0	800	Chenik Creek/Lake	Aerial/ ground survey
1961		100	0	100	Chenik Creek/Lake	Aerial/ ground survey
1962		1,500	0	1,500	Chenik Creek/Lake	Aerial/ ground survey
1963		300	0	300	Chenik Creek/Lake	Aerial/ ground survey
1964-65		ND	0	ND	Chenik Creek/Lake	No Survey
1966		200	0	200	Chenik Creek/Lake	Aerial/ ground survey
1967		2,500	0	2,500	Chenik Creek/Lake	Aerial/ ground survey
1968-70		ND	0	ND	Chenik Creek/Lake	ND
1971		2,000	0	2,000	Chenik Creek/Lake	Aerial
1972		700	0	700	Chenik Creek/Lake	Aerial
1973		300	0	300	Chenik Creek/Lake	Aerial
1974		100	0	100	Chenik Creek/Lake	Aerial
1975		100	0	100	Chenik Creek/Lake	Aerial
1976		900	0	900	Chenik Creek/Lake	Aerial
1977		200	0	200	Chenik Creek/Lake	Aerial
1978		100	0	100	Chenik Creek/Lake	stocking begins
1979		40	0	40	Chenik Creek/Lake	Aerial
1980		3,500	0	3,500	Chenik Creek/Lake	Aerial
1981		2,500	0	2,500	Chenik Creek/Lake	Aerial
1982		8,000	0	8,000	Chenik Creek/Lake	Aerial
1983		28,567	4,000	13,800	Chenik Creek/Lake	
1984		13,000	16,500	29,500	Chenik Creek/Lake	
1985		3,500	10,500	14,100	Chenik Creek/Lake	

Appendix 3. Chenik Lake 2007 – Chenik Lake Historic Escapement (continued)

Year	Date	Escapement	Harvest	Total Return	Area Surveyed	Remarks
1986		7,000	111,000	118,300	Chenik Creek/Lake	
1987		10,000	102,000	112,000	Chenik Creek/Lake	
1988		9,000	164,200	173,200	Chenik Creek/Lake	
1989		12,000	38,900	50,900	Chenik Creek/Lake	cabin constructed
1990	7/13-7/30	22,000	69,200	87,100	Chenik Creek/Lake	Aerial
1991	ND	10,000	60,000	70,000	Chenik Creek/Lake	IHNV confirmed Weir
1992	6/29-7/31	9,269			Chenik Creek/Lake	IHNV confirmed Weir
1993	6/20-8/9	4,000			Chenik Creek/Lake	32% IHNV Weir
1994	6/24-7/29	808			Chenik Creek/Lake	no IHNV in smolts Weir
1995	7/1-7/30	1,086			Chenik Creek/Lake	no IHNV in smolts Weir
1996	7/2-7/29	2,990			Chenik Creek/Lake	no IHNV in smolts Weir
1997	7/2-7/28	2,338			Chenik Creek/Lake	ADF&G Weir
	7/15	1,730			Chenik Creek/Lake	ADF&G Aerial
1998	7/3	500			Chenik Creek/Lake	ADF&G Aerial
	7/22	500			Chenik Creek/Lake	ADF&G Aerial
	7/28	1,880			Chenik Creek/Lake	ADF&G Aerial
	8/10	810			Chenik Creek/Lake	ADF&G Aerial
1999	6/28	0			Chenik Creek/Lake	ADF&G Aerial
	7/12	370			Chenik Creek/Lake	ADF&G Aerial
	7/23	1,600			Chenik Creek/Lake	ADF&G Aerial
	8/3	2,850			Chenik Creek/Lake	ADF&G Aerial
	8/17	2,190			Chenik Creek/Lake	ADF&G Aerial
2000	6/26	0			Chenik Creek/Lake	ADF&G Aerial
	6/30	0			Chenik Creek/Lake	ADF&G Aerial
	7/7	730			Chenik Creek/Lake	ADF&G Aerial
	7/12	2,000			Chenik Creek/Lake	ADF&G Aerial
	7/19	3,000			Chenik Creek/Lake	ADF&G Aerial
	7/23	4,800			Chenik Creek/Lake	ADF&G Aerial
2001	8/7	4,300			Chenik Creek/Lake	ADF&G Aerial
	6/19	0			Chenik Creek/Lake	ADF&G Aerial
	7/3	0			Chenik Creek/Lake	ADF&G Aerial
	7/7	250			Chenik Creek/Lake	ADF&G Aerial
	8/1	70			Chenik Creek/Lake	ADF&G Aerial
	8/2	30			Chenik Creek/Lake	ADF&G Aerial
	8/7	80			Chenik Creek/Lake	ADF&G Aerial
2002	8/10	132			Chenik Creek/Lake	ADF&G Aerial
	7/2	0			Chenik Creek/Lake	ADF&G Aerial
	7/8	40			Chenik Creek/Lake	ADF&G Aerial
	7/12	1,750			Chenik Creek/Lake	ADF&G Aerial
	7/25	4,650			Chenik Creek/Lake	ADF&G Aerial
2003	7/30	2,300			Chenik Creek/Lake	ADF&G Aerial
	6/26	0			Chenik Creek/Lake	ADF&G Aerial
	7/3	0			Chenik Creek/Lake	ADF&G Aerial
	7/8	2,900			Chenik Creek/Lake	ADF&G Aerial
	7/14	3,275			Chenik Creek/Lake	ADF&G Aerial
	7/21	8,200			Chenik Creek/Lake	ADF&G Aerial
2003	7/29	3,500			Chenik Creek/Lake	ADF&G Aerial
	8/4	13,825			Chenik Creek/Lake	ADF&G Aerial

Appendix 3. Chenik Lake 2007 – Chenik Lake Historic Escapement (continued)

Year	Date	Escapement	Harvest	Total Return	Area Surveyed	Remarks	
2004	6/21	0			Chenik Creek/Lake	ADF&G	Aerial
	6/25	0			Chenik Creek/Lake	ADF&G	Aerial
	6/29	0			Chenik Creek/Lake	ADF&G	Aerial
	7/4	0			Chenik Creek/Lake	ADF&G	Aerial
	7/8	5			Chenik Creek/Lake	ADF&G	Aerial
	7/12	2,450			Chenik Creek/Lake	ADF&G	Aerial
	7/15	300			Chenik Creek/Lake	ADF&G	Aerial
	7/19	12,600			Chenik Creek/Lake	ADF&G	Aerial
	8/3	17,006			Chenik Creek/Lake	ADF&G	Aerial
2005	7/1-8/4	12,775			Chenik Creek/Lake	CIAA	Weir
	6/21	0			Chenik Creek/Lake	ADF&G	Aerial
	6/24	30			Chenik Creek/Lake	ADF&G	Aerial
	6/27	0			Chenik Creek/Lake	ADF&G	Aerial
	7/1	0			Chenik Creek/Lake	ADF&G	Aerial
	7/5	0			Chenik Creek/Lake	ADF&G	Aerial
	7/11	200			Chenik Creek/Lake	ADF&G	Aerial
	7/15	280			Chenik Creek/Lake	ADF&G	Aerial
	7/20	820			Chenik Creek/Lake	ADF&G	Aerial
2006	7/1-8/3	8,514			Chenik Creek/Lake	CIAA	Weir
	6/27-7/7 & 7/25-8/12	6,709			Chenik Creek/Lake	ADF&G	Video
	6/27	0			Chenik Creek/Lake	ADF&G	Aerial
	6/30	100			Chenik Creek/Lake	ADF&G	Aerial
	7/3	0			Chenik Creek/Lake	ADF&G	Aerial
	7/7	0			Chenik Creek/Lake	ADF&G	Aerial
	7/10	0			Chenik Creek/Lake	ADF&G	Aerial
	7/17	0			Chenik Creek/Lake	ADF&G	Aerial
	8/1	3,400			Chenik Creek/Lake	ADF&G	Aerial
2007	6/28-8/4	17,431			Chenik Creek/Lake	CIAA	Weir
	6/22-8/24	17,529			Chenik Creek/Lake	ADF&G	Video
	6/27	170			Chenik Creek/Lake	ADF&G	Aerial
	7/2	10			Chenik Creek/Lake	ADF&G	Aerial
	7/5	1,910			Chenik Creek/Lake	ADF&G	Aerial
	7/9	1,050			Chenik Creek/Lake	ADF&G	Aerial
	7/12	2,320			Chenik Creek/Lake	ADF&G	Aerial
	7/17	2,990			Chenik Creek/Lake	ADF&G	Aerial
	7/20	3,550			Chenik Creek/Lake	ADF&G	Aerial
	7/26	8,300			Chenik Creek/Lake	ADF&G	Aerial