

**Chenik Lake
Progress Report
2006**

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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 2006. Appreciation is extended to Cook Inlet Aquaculture Association seasonal field assistants, Kevin Lauscher and Andrew Weible; 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 2006 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 second 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. In 2006, the video count was incomplete and a comparison between the weir and video total counts could not be made. During CIAA and ADF&G monitoring efforts from 22 June through 24 August, an estimated total adult sockeye salmon escapement was 10,691.

ADF&G monitored Chenik Creek by video recording from 28 June to 7 July and from 25 July to 12 August 2006. The total video count during these two periods was 6,709 adult sockeye salmon.

CIAA monitored Chenik Creek by use of weir from 6 July and continued daily until 2 August 2006. During this period, 8,514 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 488 mm. The average male length was 499 mm, and the average female length was 476 mm. The percentage of adult male and adult female sockeye salmon returning to Chenik Creek in 2006 was 55.5% and 44.5%, respectively. Adult males averaged 499 mm in length, and adult females averaged 476 mm. An estimated 90.6% of the population was age 1.2, 5.2% were age 1.3, 3.1% were age 2.2, and 1.0% were age 2.3.

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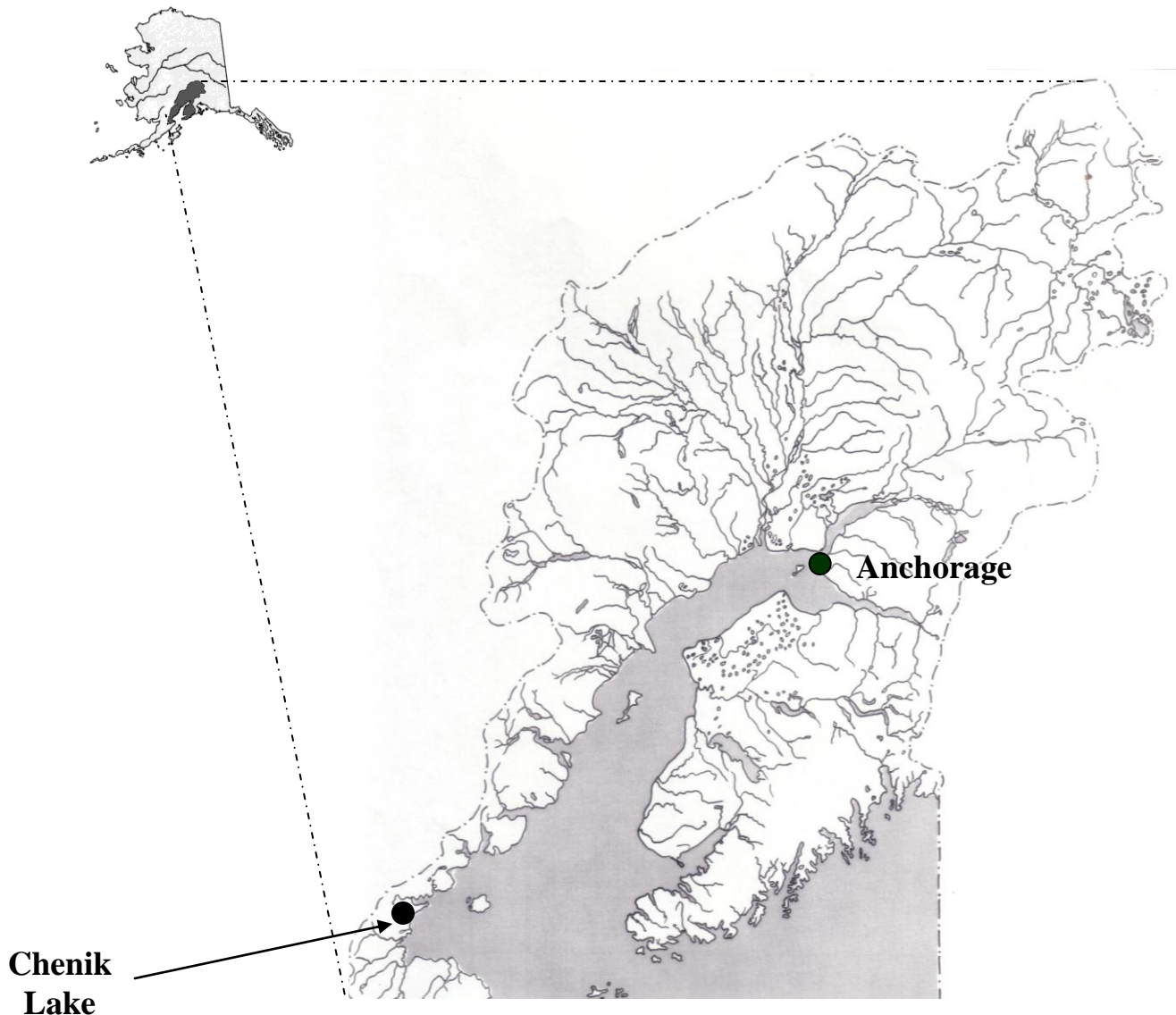
INTRODUCTION AND PURPOSE

The Cook Inlet Aquaculture Association (CIAA) is concerned about maintaining the long-term health of self-sustaining salmon runs in the Cook Inlet region through responsible appropriate actions and research. 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 most wanted escapement information. Chenik Lake was identified as a high priority for research due to its recovering sockeye salmon population 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 from ADF&G's video recorder enumeration system with a more traditional adult salmon weir count as well as provide timely information for critical management decisions.

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PROJECT AREA

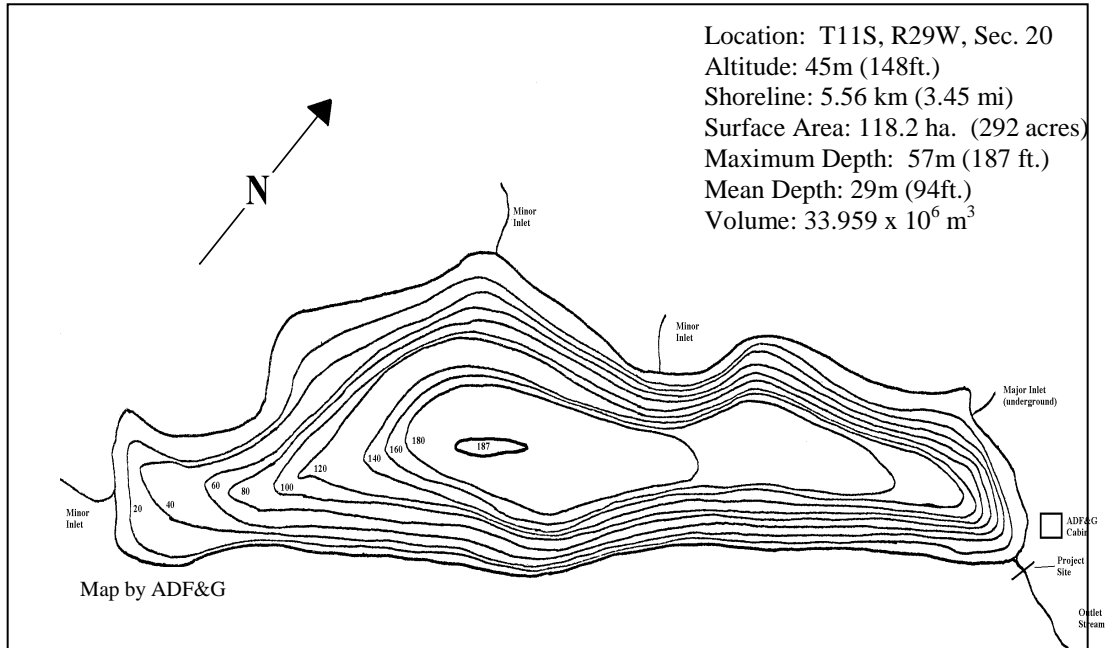
Chenik Lake is located on the west side of lower Cook Inlet approximately 338 kilometers SSW of Anchorage (Figure 1). The land is characterized by rolling foothills (Figure 2) of the Aleutian Range and is generally less than 1,433 meters in elevation (Division of Habitat and Restoration and Wildlife 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 57 m, a mean depth of 29m, a 5.6 km shoreline, and is located at an elevation of 42 m 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 466 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 7 July to 2 August 2006. Stream stage measurements averaged 0.48 feet and ranged from 0.38 to 0.71 feet. Stream temperatures averaged 11°C and ranged from 10 to 15°C and air temperatures averaged 14°C and ranged from 10 to 24°C. Eleven percent of the days were clear, 19% were partly cloudy, and 70% were completely overcast. Rain was recorded on 11 of the days during the adult migration. A total of 72 mm of rain fell during this period (Appendix 1).

Adult Escapement

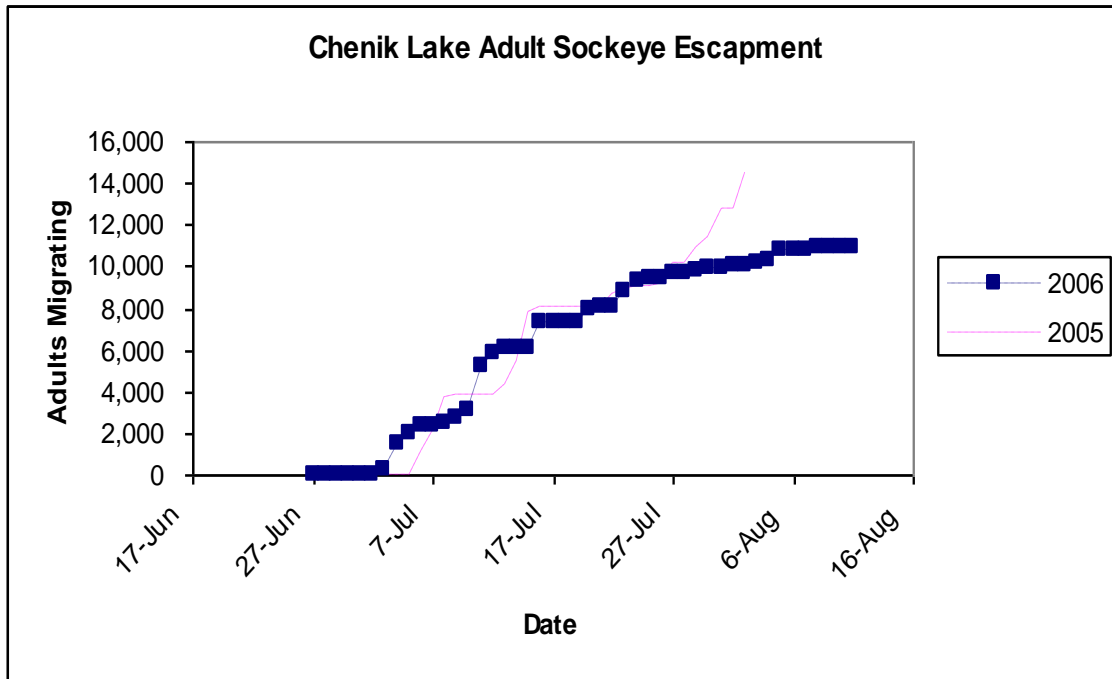
The adult sockeye salmon escapement was manually enumerated by weir from 6 July to 2 August 2006. During this period, 8,514 adult sockeye salmon returned to Chenik Creek. ADF&G video count was available from 28 June to 7 July and from 25 July to 12 August 2006. The video count for this period was 6,709 adult sockeye salmon. A video count in comparison with a weir count could not be made. To estimate the number of adult sockeyes returning to Chenik Creek, the ADF&G video count was supplemented to the total escapement for days when the weir was not in operation. The combined weir and video count from 28 June through 2 August was 10,691 adult sockeye salmon (Appendix 2).

The percentage of adult male and adult female sockeye salmon returning to Chenik Lake in 2006 was 55.5% and 44.5%, respectively. Based on scale samples collected, the average adult sockeye population was 488 mm. Males averaged 499 mm (19.6 in) in length and females averaged 476 mm (18.74 in). An estimated 90.6% of the fish were age 1.2, 5.2% were age 1.3, 3.1% were 2.2, and 1.0% were 2.3 (Table 1).

Table 1. Chenik Lake adult sockeye salmon escapement, age distribution and fish length.

Year	Escapement		Sex Class		Age Classes							
	weir count	weir & video combined count	male (%)	female (%)	1.2 (%)	1.2 Lth(mm)	1.3 (%)	1.3 Lth(mm)	2.2 (%)	2.2 Lth(mm)	2.3 (%)	2.3 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

Table 2. Chenik Lake adult sockeye salmon escapement



RECOMMENDATIONS

The Cook Inlet Aquaculture Association as well as Alaska Department of Fish and Game Homer office recommends the monitoring continue next year 2007.

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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. Pages A-1. 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. Pages 16-17 &19. Cook Inlet Aquaculture Association 40610 Kalifornsky Beach Road Kenai, Alaska 99611

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APPENDICES

Appendix 1. Chenik Lake 2006 – Environmental Conditions.

Date	Sky	Precip. (mm)	Stage (ft)	Flow	Water Temp. (°C)	Air Temp. (°C)
7-Jul	5	11	0.50	ND	10.5	12.5
8-Jul	2	1	0.48	ND	14.0	20.0
9-Jul	4	0	0.47	ND	12.5	16.5
10-Jul	4	0	0.47	ND	9.5	11.0
11-Jul	4	0	0.44	ND	10.5	12.5
12-Jul	1	0	0.47	ND	14.5	23.5
13-Jul	2	0	0.48	ND	13.5	19.5
14-Jul	4	0	0.43	ND	13.5	15.0
15-Jul	3	0	0.46	ND	13.0	16.5
16-Jul	4	0	0.40	ND	11.5	10.5
17-Jul	4	0	0.38	ND	10.5	11.0
18-Jul	4	0	0.38	ND	10.0	12.5
19-Jul	4	0	0.38	ND	10.0	13.0
20-Jul	5	4	0.39	ND	11.5	13.0
21-Jul	5	2	0.40	ND	11.0	12.0
22-Jul	5	18	0.41	ND	10.5	10.5
23-Jul	5	14	0.41	ND	9.5	10.0
24-Jul	4	4	0.61	ND	10.0	10.0
25-Jul	5	14	0.70	ND	10.5	10.0
26-Jul	3	3	0.71	ND	12.0	17.5
27-Jul	1	0	0.66	ND	12.5	22.5
28-Jul	4	0	0.58	ND	10.5	14.0
29-Jul	1	0	0.65	ND	12.0	14.0
30-Jul	3	2	0.48	ND	11.5	15.5
31-Jul	4	0	0.47	ND	11.5	13.5
1-Aug	4	0	0.45	ND	11.5	12.5
2-Aug	4	1	0.42	ND	10.0	11.5
Total		72				
Avg.		3	0.48	ND	11	14
Min.		0	0.38	ND	10	10
Max.		18	0.71	ND	15	24

Appendix 2. Chenik Lake 2006 – Adult Sockeye Escapement.

Date	Weir Escapement		Video Count	Total
	Daily	Total		
28-Jun			2	2
29-Jun			0	2
30-Jun			1	3
1-Jul			1	4
2-Jul			0	4
3-Jul			0	4
4-Jul			225	229
5-Jul			1,294	1,523
6-Jul	405	405		1,928
7-Jul	379	784		2,307
8-Jul	101	885		2,408
9-Jul	16	901		2,424
10-Jul	257	1,158		2,681
11-Jul	440	1,598		3,121
12-Jul	2,113	3,711		5,234
13-Jul	570	4,281		5,804
14-Jul	223	4,504		6,027
15-Jul	1	4,505		6,028
16-Jul	0	4,505		6,028
17-Jul	1,268	5,773		7,296
18-Jul	34	5,807		7,330
19-Jul	18	5,825		7,348
20-Jul	0	5,825		7,348
21-Jul	607	6,432		7,955
22-Jul	145	6,577		8,100
23-Jul	6	6,583		8,106
24-Jul	724	7,307		8,830
25-Jul	529	7,836		9,359
26-Jul	49	7,885		9,408
27-Jul	3	7,888		9,411
28-Jul	224	8,112		9,635
29-Jul	56	8,168		9,691
30-Jul	144	8,312		9,835
31-Jul	48	8,360		9,883
1-Aug	0	8,360		9,883
2-Aug	154	8,514		10,037
3-Aug			57	10,094
4-Aug			41	10,135
5-Aug			168	10,303
6-Aug			458	10,761
7-Aug			59	10,820
8-Aug			20	10,840
9-Aug			98	10,938
10-Aug			6	10,944
11-Aug			13	10,957
12-Aug			4	10,961
Total		8,514		10,961

* CIAA weir count period from 6 July through 2 August.
ADF&G video count periods 28 June - 5 July & 3 August - 12 August.

Appendix 3. Chenik Lake 2006 – 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 2006 – 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
	8/7	4,300			Chenik Creek/Lake	ADF&G Aerial
2001	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
	8/10	132			Chenik Creek/Lake	ADF&G Aerial

Appendix 3. Chenik Lake 2006 – Chenik Lake Historic Escapement (continued)

Year	Date	Escapement	Harvest	Total Return	Area Surveyed	Remarks	
2002	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
	7/30	2,300			Chenik Creek/Lake	ADF&G	Aerial
2003	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
	7/29	3,500			Chenik Creek/Lake	ADF&G	Aerial
	8/4	13,825			Chenik Creek/Lake	ADF&G	Aerial
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