

2005 Salmon River Wild Young-of-Year Chinook Salmon Seining Program

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Seasonal baseflows mandated by the Federal Energy Regulatory Commission hydroelectric licencing agreement (FERC 1996) have resulted in a dramatic increase in natural reproduction of Chinook salmon in the Salmon River since 1997. A cooperative index seining program was initiated in the Spring of 1999 by the U.S. Geological Survey (USGS) and the New York State Department of Environmental Conservation (NYSDEC) to assess spatial and temporal aspects of relative abundance, size structure, and distribution of wild young-of-year (YOY) Chinook salmon at four sites in the river. The program was continued for a seventh year in 2005.

Methods

Seine hauls were conducted weekly at four sites (Altmar, Pineville, CO. RT. 2A, and Douglaston, Figure 1) from 9 May through 21 June. The seine was a 20 foot bag seine 6 feet deep with 1/8 inch bar mesh. Hauls were made by stretching the seine perpendicular to the current and sweeping downstream toward one bank to a suitable landing area. A sample consisted of one seine haul per site. Obstacles on the river bottom and differences in the lengths of the hauls prevented the use of catches per unit of effort as precise density estimates but the range of numbers captured between sites and dates do provide a rough estimate of density.

All species captured were counted and a sample of chinook were measured (total length) for each haul. Mean lengths of chinook captured for each date and site were compared using a pairwise t-test multiple comparison procedure (SAS Proc GLM, SAS

Institute 1999).

Results and Discussion

Densities of YOY Chinook in 2005 were relatively high compared with previous years. The peak catch occurred on 24 May (Figure 2). Similar to what occurred in 2004, densities remained higher throughout June than in most of the previous years (Bishop et al. 2005). This occurred despite a relatively hot and dry June.

The relatively high abundances of YOY chinook in 2004 and 2005 were probably the result of adequate baseflows in the river during the spawning periods which occur in October of the previous year (Figure 3). Note that baseflows were below the prescribed 335 cubic feet per second (cfs) in 2002, well above it in 2003 and very close to it in 2004. Adequate flows increase available spawning habitat and tend to make fish less vulnerable to the sport fishery, allowing more fish to survive and spawn. In contrast, drought conditions during the fall of 2002 resulted in low flows, reduced spawning habitat, potentially higher exploitation on spawners and subsequent low production of YOY chinook in 2003.

Sizes of YOY chinook sampled in 2005 were similar to those sampled in previous years. Fish are approximately 1.6 inches long at first capture in early May and exceed 2 inches by the latter half of June. Results of the ANOVA comparing mean lengths by site and date are presented in Table 1.

References

Bishop, D. L., J. H. Johnson and M. E. Penney-Sabia. 2005. 2004 Salmon River wild young-of-year Chinook salmon seining program Section 8 in 2004 Annual Report, Bureau of Fisheries, Lake Ontario Unit and St. Lawrence River Unit to the Great Lakes Fishery Commission's Lake Ontario Committee.

Federal Energy Regulatory Commission (FERC). 1996. Order issuing original license (Major Project). Washington, D.C.: Federal Energy Regulatory Commission. FERC Project No. 11408, New York.

SAS Institute Inc., 1999. Release 8.0 TS level 00M0. Cary, NC, USA.

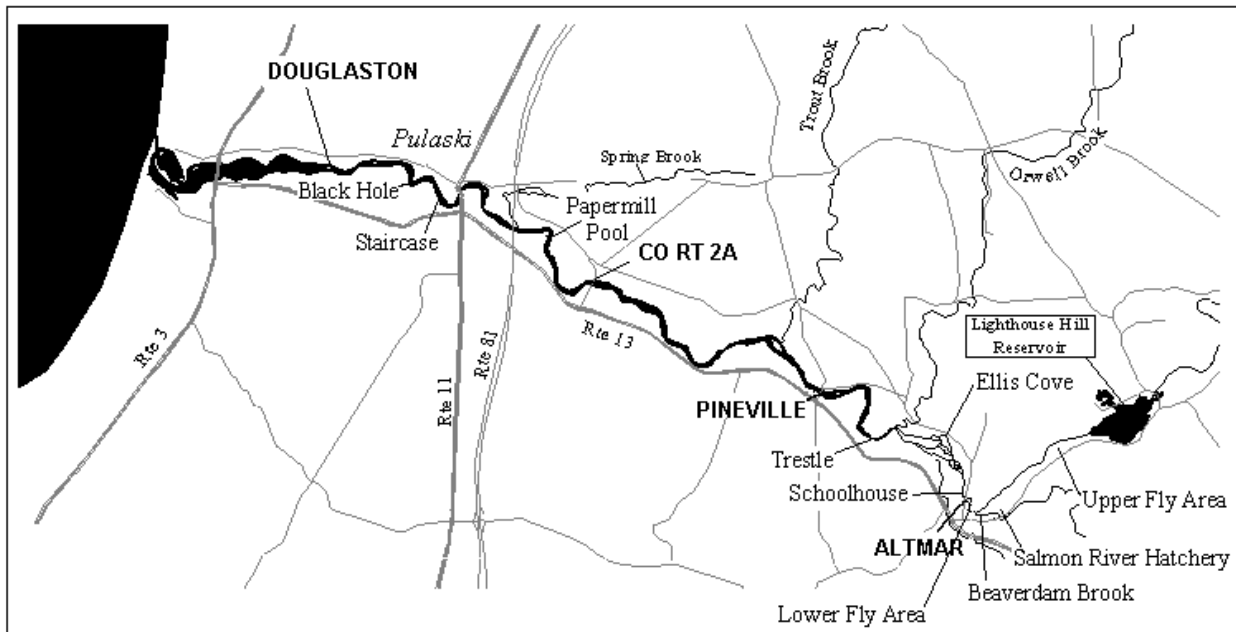


Figure 1. Sampling sites for the USGS/DEC 2005 Salmon River seining program.

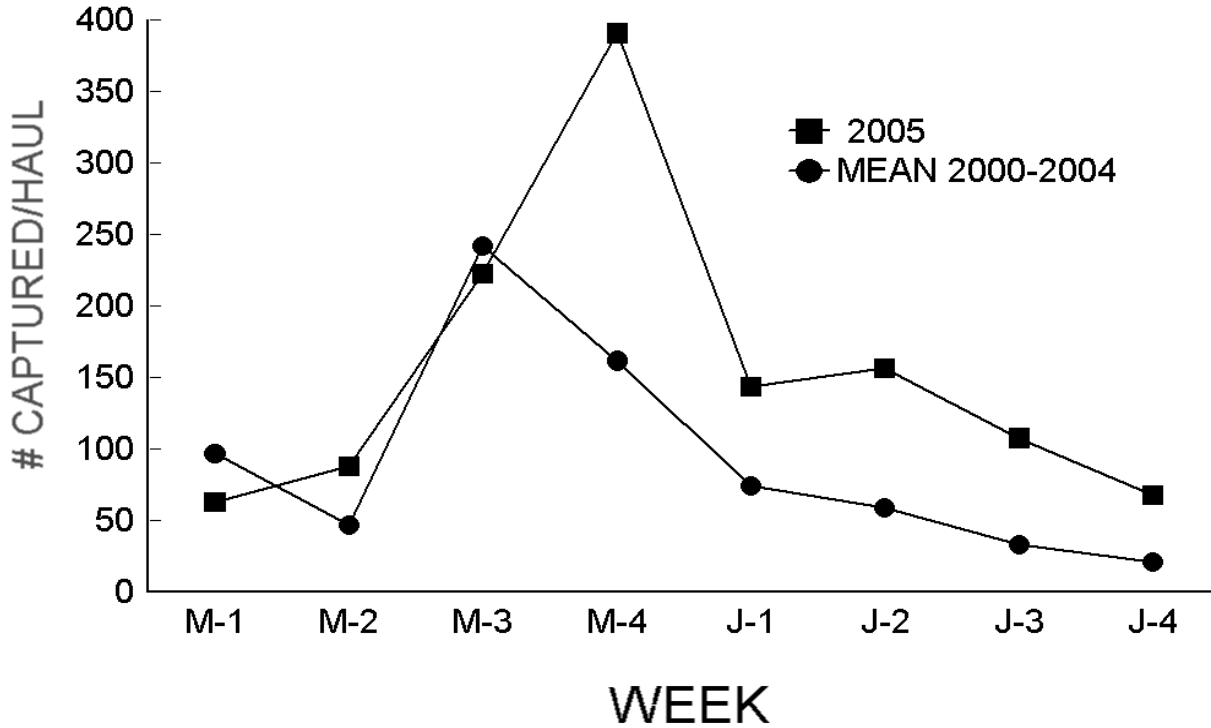


Figure 2. Mean numbers of young-of-year chinook salmon captured per seining haul by week in the USGS/DEC Salmon River seining program for 2000-2004 and 2005 (M=May, J=June).

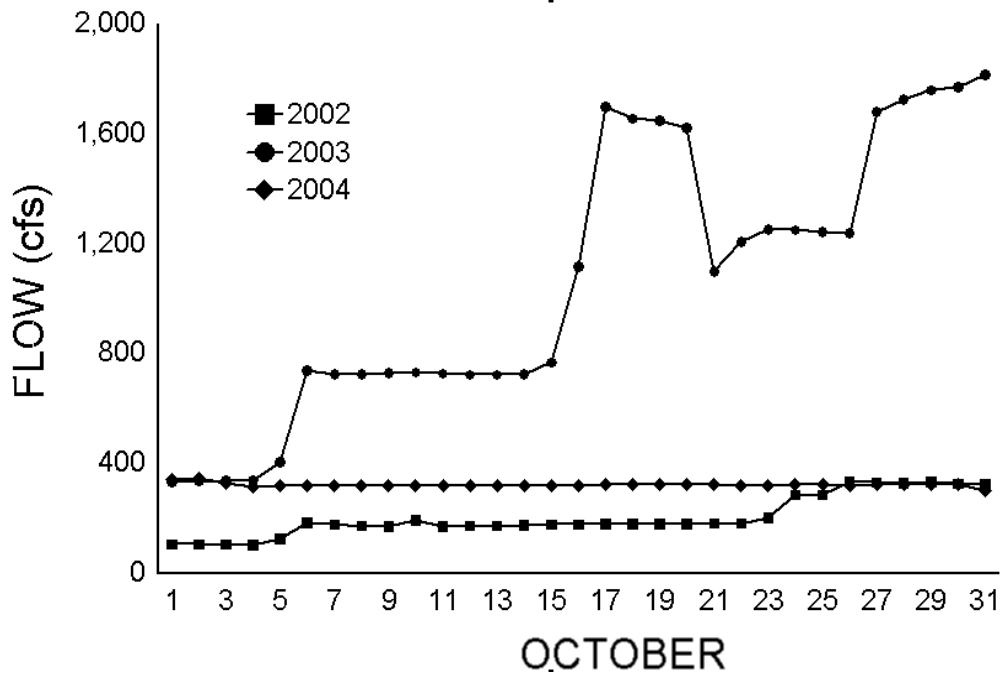


Figure 3. October 2002-2004 Salmon River flows from the Lighthouse Hill Reservoir (Brascan Power records). Note that the prescribed baseflow of 335 cubic feet per second (cfs).

Table 1. Multiple range comparisons (pairwise t-tests, $\alpha=0.05$) of mean lengths of wild young-of-year chinook salmon by site and date from the 2005 USGS/DEC Salmon River seining program.

SITE	DATE	NUMBER MEASURED	MEAN		T-GROUPING - 1
			LENGTH (in)	STANDARD DEVIATION	
CO RT 2A	21 JUNE	30	2.2	0.3	A
ALTMAR	15 JUNE	30	2.2	0.4	B A
PINEVILLE	21 JUNE	30	2.1	0.2	B A
DOUGLASTON	9 JUNE	30	2.1	0.4	B A
DOUGLASTON	21 JUNE	26	2.1	0.2	B A
DOUGLASTON	2 JUNE	30	2.1	0.2	B
DOUGLASTON	15 JUNE	30	2.1	0.3	B C
ALTMAR	21 JUNE	30	2.1	0.3	B C
CO RT 2A	15 JUNE	30	2.0	0.2	D C
DOUGLASTON	24 MAY	30	2.0	0.3	D C
ALTMAR	9 JUNE	30	2.0	0.3	D C E
CO RT 2A	2 JUNE	30	1.9	0.3	D E
ALTMAR	2 JUNE	30	1.9	0.3	D F E
CO RT 2A	9 JUNE	30	1.9	0.3	D F E
PINEVILLE	15 JUNE	30	1.8	0.2	G F E
PINEVILLE	9 JUNE	30	1.8	0.2	G F H
PINEVILLE	2 JUNE	30	1.7	0.2	G I H
PINEVILLE	5 MAY	30	1.7	0.1	J I H
DOUGLASTON	18 MAY	30	1.7	0.1	J I H
ALTMAR	24 MAY	30	1.7	0.2	J I H
PINEVILLE	18 MAY	30	1.7	0.2	J I K
DOUGLASTON	9 MAY	30	1.7	0.1	J I K
DOUGLASTON	5 MAY	17	1.7	0.1	J L I K
CO RT 2A	24 MAY	30	1.7	0.1	J L I K
PINEVILLE	24 MAY	30	1.6	0.1	J L I K
CO RT 2A	18 MAY	30	1.6	0.1	J L I K
CO RT 2A	9 MAY	30	1.6	0.1	J L I K
CO RT 2A	5 MAY	27	1.6	0.1	J L K
ALTMAR	5 MAY	30	1.6	0.1	J L K
ALTMAR	18 MAY	30	1.6	0.1	J L K
PINEVILLE	9 MAY	30	1.6	0.1	L K
ALTMAR	9 MAY	30	1.6	0.1	L

1-Means with the same letter are not significantly different.