McIntyre Creek Adult Chinook Salmon Enumeration: Final Report 1998

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Prepared for: Yukon River Panel
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Abstract

This study was conducted to determine the number of adult Chinook salmon returning to McIntyre Creek. A counting weir was operated in August of 1998 at the mouth of McIntyre Creek to assess the spawning population. A total of eight Chinook salmon were counted through the weir, six males and two females. Adult Chinook were also assessed on the basis of origin: wild or hatchery. One returning Chinook was adipose-clipped, denoting hatchery origin.

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Introduction

McIntyre Creek is a left (west) bank tributary of the Yukon River, located in the City of Whitehorse. McIntyre Creek has been impacted on in numerous ways due to it's urban locale. These include: former city landfill site located at the mouth, hydroelectrical project at the head waters, three culverts at road crossings (Alaska Highway, Mt. View Drive and Range Road respectively going downstream). It is also utilized by a commercial fish farm and a Salmon Enhancement Project. In the early 20th century, McIntyre Creek was at the center of the Whitehorse Copper Belt mining operations.

In the early 1990's, it became known that adult Chinook salmon were utilizing McIntyre Creek for spawning purposes. Subsequent stream surveys by DFO personnel verified this, but accurate numbers of returning Chinook were not attained.

Due to its urban location, it is important to determine the extent of Chinook salmon utilization in McIntyre Creek. The potential for public education & awareness development is extremely high. Also, having accurate numbers is crucial for management purposes.

It was proposed a weir be erected at the mouth of McIntyre Creek to achieve these objectives.

Methods

i) Site Selection & Logistics

The weir site was located approximately 1 kilometre upstream from McIntyre Creek's confluence with the Yukon River. It was necessary to place the weir this far upstream due to braided channels accompanied with insufficient flow directly below the weir, and slack/still water in the lowest reaches of McIntyre Creek. The selected site provided the necessary attraction flow through the counting chamber after the weir was constructed.

ii) Weir Construction

The weir consisted of a fence of two horizontal, wooden stringers mounted on wooden tripods. One inch electrical conduit was threaded through the stringers, spaced at about 3/4 inches. A counting chamber was constructed of conduit and wooden stringers. The counting chamber was placed flush to one bank, with the conduit fence placed flush to the counting chamber and across the creek. The junction between the counting chamber and fence was sealed with Vexar. This created a fish-tight fence.

iii) Enumeration Techniques

Adult Chinook salmon were captured in the counting chamber through a gate made by pulling two pieces of conduit on the downstream end of the pen. Once inside the pen, Chinook were assessed on the basis of sex and wild or hatchery origin (by presence/absence of adipose fin). After this assessment, the fish were allowed to continue by pulling two pieces of conduit on the upstream end of the counting chamber. Surveys were conducted downstream of the weir to assess spawning activity in this section.

iv) Sampling Techniques

Live sampling was conducted on a limited basis. The sex of the fish was recorded. Fork and post-orbital hypural lengths were determined. As well, five scales were removed for age determination.

v) Physical Parameters

Water temperature and depth levels were recorded twice daily. Water temperatures were measured using a staff gauge attached to the counting chamber. Temperatures were taken using a handheld thermometer.

Results and Discussion

i) Enumeration

A total of 8 Chinook salmon returned to McIntyre Creek between August 2 and September 1. The run comprised of three unclipped males, two unclipped females, one adipose-clipped female, and two unclipped male jacks. Fish were observed at the weir from August 11 to August 31. No fish were observed spawning in the section downstream of the weir. (see Appendix I)

ii) Sampling

Two of the eight fish counted through the weir were live-sampled at the site (25% of total run). Fork and post-orbital hypural lengths were taken from both. Five scales were removed from one individual for aging purposes (at the time of this writing, scale analysis results were unavailable). (see Appendix II)

iii) Physical Parameters

Water depths ranged from a maximum of 44 cm to a minimum of 25 cm. Water depth was higher at the beginning of the enumeration period, but generally remained constant throughout. However, a rapid rise and fall in water level was observed on August 9. An accurate measure was not attained, but it was approximated that the level rose 20 cm over normal.

Water temperatures ranged from a high of 13 degrees Celsius to a low of 7 degrees Celsius. Water temperatures progressively declined from start to finish of the project. (see Appendix III)

Recommendations

It is recommended that the enumeration of McIntyre Creek adult Chinook salmon continue for 2-4 more subsequent years to assess its current and potential fish-producing capability. As well, juvenile studies should be conducted to determine extent of utilization by natal and non-natal populations. An assessment of current and potential spawning and rearing habitat should also be conducted to determine potential enhancement possibilities. Finally, due to the existing hydroelectric project on McIntyre Creek, minimum flow rate guidelines should be established to protect existing and future populations.

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Appendix 1:
Daily Chinook Salmon Counts

Date	Male Clipped	Male Unclipped	Female Clipped	Female Clipped	Jack Clipped	Jack Unclipped
8/2						
8/3						
8/4						
8/5						
8/6						
8/7						
8/8						
8/9						
8/10						
8/11						
8/12						1
8/13						
8/14						
8/15						
8/16						
8/17						
8/18						
8/19						
8/20						
8/21						
8/22						
8/23						
8/24		1		1		1
8/25						
8/26						
8/27		1	1			
8/28		1				
8/29						
8/30						
8/31				1		
9/1						
9/2	Weir Pulled					

Appendix 2:
Daily Water Temperature & Depth

	AM		PM	
Date	Temp	Depth	Temp	Depth
8/2				
8/3				
8/4	50		55	
8/5	51		55	
8/6	50		54	
8/7	50	44	54	44
8/8	51	32	55	
8/9				
8/10	50	28	50	
8/11	49	28	50	28
8/12	48	29	54	25
8/13	50	28	54	27
8/14	49	30	54	29
8/15	49	28	55	27
8/16	49	27	54	30
8/17	49	27	55	27
8/18	48	27	52	27
8/19	49	28	53	27
8/20	48	28	51	27
8/21	49	28	52	27
8/22	48	28	51	27
8/23	48	28	51	27
8/24	47	28	50	27
8/25	48	28	51	27
8/26				
8/27				
8/28				
8/29				
8/30				
8/31	46	28	50	27
9/1	45	27	49	27
9/2	Weir Pulled			

Temp - Degrees Farenheit
Depth - Centimetres