Coquitlam Water Use Plan

Pink Salmon Passage in Lower Coquitlam River

COQMON#4

Study Period: August 1, 2007 – October 31, 2007
Report Date: January 2008

Scott Ducharme, Aquatec Resources

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ASSESSMENT OF PINK SALMON PASSAGE IN LOWER COQUITLAM RIVER

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IN LOWER COQUITLAM RIVER

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EXECUTIVE SUMMARY

A fisheries technical document was reviewed by the Coquitlam / Buntzen Water Use Planning Committee and indicated historic evidence of restricted mainstem passage at flows < 100cfs (2.8cms). With the recent return of pink salmon, and summertime low flows expected to persist, this study was commissioned to monitor early returning pink salmon migration in mainstem Coquitlam River.

An initial site survey identified 7 passage index sites that had the potential of restricting pink salmon migration on the lower Coquitlam River. Monitoring at index sites indicated that at the present flow regime (treatment 1) with minimum releases of 0.8cms, access was not impeded for migrating pink spawners at any of the index sites during the monitoring periods August 25 – September 31, 2007. Observations identified that low flow condition might affect pink salmon off channel habitat use and may limit or restrict access to these sites. BC Hydro adult enumeration data indicated that pink salmon were observed throughout the system and upstream of all index sites during mid and late September. Precipitation and pink salmon migration were strongly linked during late September with a significant portion of migration occurring in the last week of September.

Although there were no migration access issues during base flows of treatment 1, minimum discharge rate increases under requirements of treatment 2 will improve access and migration in mainstem Coquitlam River and also increase available access to off channel habitat.
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1.0 INTRODUCTION

1.1 Background

Jarvis (2001) report provided historical evidence that mainstem salmon spawning migration had been restricted during summer low flows when discharges are less than 100cfs (2.8cms). There have been no known fish passage issues in the lower Coquitlam River during low flows since implementing Treatment 1, releasing between 0.8-1.4cms, since 1999, and this flow regime is expected to continue throughout the completion of the Coquitlam Dam seismic upgrade in 2008 at which time flows are increased with treatment 2 releases (table 1). In 2003 and 2005 pink salmon returns were recorded in late Sept/Oct and it is possible that pink salmon runs in the Fraser River can access tributaries as early as August (Macnair and Lewis 2003). With the increased pink salmon escapements in recent years, there are potential access issues for migrating adults in late summer during low flows.

Table 1 - Annual schedule for release amounts from Coquitlam Dam, note: August and September current and targeted discharge amounts (Coq-Buntzen WUP, 2006).

<table>
<thead>
<tr>
<th>Date</th>
<th>Treatment 1</th>
<th>Coquitlam Dam Release Schedule (CMS)</th>
<th>Species Driver and Priority for Coquitlam River releases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment 2</td>
<td>Treatment 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current Minimum</td>
<td>(CMS) Target</td>
<td>(CMS) Minimum</td>
</tr>
<tr>
<td>1-Jan</td>
<td>1.0</td>
<td>5.9</td>
<td>3.6</td>
</tr>
<tr>
<td>15-Jan</td>
<td>1.0</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Feb</td>
<td>1.0</td>
<td>2.9</td>
<td>1.8</td>
</tr>
<tr>
<td>Mar</td>
<td>0.8</td>
<td>4.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Apr</td>
<td>0.8</td>
<td>3.5</td>
<td>1.1</td>
</tr>
<tr>
<td>May</td>
<td>1.1</td>
<td>2.9</td>
<td>1.1</td>
</tr>
<tr>
<td>June</td>
<td>1.4</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>July</td>
<td>1.4</td>
<td>1.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Aug</td>
<td>1.1</td>
<td>2.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Sept</td>
<td>0.8</td>
<td>2.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Oct</td>
<td>0.8</td>
<td>6.1</td>
<td>3.6</td>
</tr>
<tr>
<td>Nov</td>
<td>1.1</td>
<td>4.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Dec</td>
<td>1.1</td>
<td>5.0</td>
<td>2.5</td>
</tr>
</tbody>
</table>
1.2 Objectives

The objective of this monitoring study is to:

1) Monitor the migration of returning pink salmon in odd years to determine if there are any flow related migration barriers in the lower mainstem Coquitlam River corridor.

2) A secondary objective is to determine at what flows each barrier is eliminated or reduced. The study will be conducted from late August to no later than October 1 each pink year (odd year) starting in September 2007 and extended though 2015.

1.3 Study Area

Potential passage index sites the Coquitlam River were divided into four reach designations, beginning upstream of Pitt River Road Bridge and extend upstream to Coquitlam Dam. It is important to note that the study consisted of mainstem usage and passage only (Figures 1 and 2). Other watershed information includes:

- Watershed code: 100-024500-00000-00000-000
- Geo-data BC Trim Map reference: 092G037, 092G027, 092G026
- Watershed size: 237 km²
- River length from mouth to Coquitlam dam: 17 km
- Study area: 12.9 km
- Coquitlam River mean annual discharge: 4.6cms
- Major Tributaries: Or Creek MAD=2.9cms, Scott/Hoy Creek MAD=1.0cms
Figure 1 – Spawning migration passage index site locations 1, 2A, 2B and 2C located in the lower portion of Coquitlam River.
Figure 2 – Spawning migration passage index site locations 3A, 3B and 4 located in the upper potion of the Coquitlam River.
2.0 METHODS

Information review, site survey development and interviews were conducted to identify all locations on the lower Coquitlam River which have historically constricted salmon spawner access during low flows. Historically, two sites of passage concern were indicated in a report by Jarvis (2001), site 1 was located upstream of Lougheed crossing and was identified as a short, high gradient river section that has detained chum salmon in the past. Site 2, located downstream of Port Coquitlam Hatchery was identified as a narrow channel with a bedrock controlled portion that was a historic holding site for all species. Reconnaissance of the river was conducted and five additional sites were identified as having the potential to limit access during low flows. Daily discharge rate information was obtained from WSC 08MH002 hydrometric data station located at Kingsway Road Bridge in Port Coquitlam and operated by Environment Canada; reservoir release discharge data at Coquitlam dam was provided by BC Hydro.

Each reach was indexed according to passage criteria, and habitat characteristics that may have the potential to constrict fish passage including: river bed gradient, barrier length, step falls, jump height, plunge pool depth, sieves, strainers, gravel, boulder and debris loading, channel widening or braiding, water depth, velocity and flow distribution. Observations of holding (sedentary) and or migrating (active) pink spawners were enumerated and overall condition and health was documented. According to data collection requirements, monitoring started in the first week of September or when the first pink salmon was observed. Communication with other BC Hydro monitoring crews conducting adult assessments of Coquitlam River was ongoing. Visual monitoring of migration attempts was conducted by two trained technicians for a maximum of 30 minute observation periods and a maximum of six survey dates.
3.0 RESULTS

Discharge rate from the dam was restricted to 0.89cms so that work could be completed on the Dam spillway from September 7 to September 19, 2007. Water was released by two lake pumps and a 12” line which distributed flow to the mainstem of Coquitlam River (Figure 3). This scenario provided significant low flow level observations during monitoring, with the lowest discharge rate recorded being 1.09cms at WSC hydrometric station. Early season monitoring, observed significant flows from Or Creek to mainstem Coquitlam and rain events occurred periodically during the month, increasing discharges temporarily (Figure 3, 4).

![Figure 3](image_url) – WSC Hydrometric station discharge (CMS) measured for the month of Sept 2007 (source: Environment Canada 2007).
Eleven days of precipitation were recorded during the monitoring period for a total of 106mm. It was observed that precipitation induced flow events instigated migration during late September. Estimated daily flow contribution from watershed tributary’s into Coquitlam mainstem during monitoring period averaged 0.651cms (WSC). Figure 4 illustrates the significance of the Coquitlam Dam valve releases to Coquitlam mainstem during low precipitation periods from mid to late September.

Figure 4 – Coquitlam Dam valve release, precipitation and total river discharge for the month of September 2007 (source: WSC 2007. Hunter 2007, Henwood 2007)
3.1 **Reach 1 ~ Index Site 1**

Access to Index site 1 (49°15.830 N -122°47.075 W) is at McAllister Park in Port Coquitlam. The site is has the potential to restrict salmon passage at low flows due to channel braiding on right bank side. During minimal discharge releases of 0.89cms and minimal flow from the major tributaries, the side channel may have the potential to constrict access due to shallow water depth (Figure 5). The average wetted width of the channel is 2.4 m and the average depth of this channel is 0.12 m. No pink salmon were observed holding or moving through at this index site although one pink carcass in good condition was recorded Sept 21, 2007 downstream of the index site. Discharge rate previous to the carcass discovery was 1.45cms and no pink salmon were observed in this channel during monitoring periods (Table 2). BC Hydro adult enumeration monitoring crew recorded 7 pink spawners during September 26 and 27 moving above the index site when mainstem flows of 1.35cms (WSC) were observed.

![Figure 5](image)

**Figure 5** – Index site 1 – mouth of side channel, Sept 21, 07, flow 1.4cms (WSC).
Table 2 – Summary of field monitoring observations of pink salmon passage and discharge in the lower Coquitlam River.

<table>
<thead>
<tr>
<th>Survey Date</th>
<th>Index Site</th>
<th>WSC Reading (cms)</th>
<th>Coq Dam Release (cms)</th>
<th>Below Dam Input (cms)</th>
<th>Days since RIFE*</th>
<th>Mean Depth (cm)</th>
<th>Mean Velocity (m/s)</th>
<th># Pink Holding</th>
<th># Pink Migrating</th>
<th># Pink Above Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>29-Aug 1</td>
<td>2.39</td>
<td>1.07</td>
<td>1.32</td>
<td>2</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29-Aug 2a</td>
<td>2.39</td>
<td>1.07</td>
<td>1.32</td>
<td>2</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29-Aug 2b</td>
<td>2.39</td>
<td>1.07</td>
<td>1.32</td>
<td>2</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29-Aug 2c</td>
<td>2.39</td>
<td>1.07</td>
<td>1.32</td>
<td>2</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29-Aug 3a</td>
<td>2.39</td>
<td>1.07</td>
<td>1.32</td>
<td>2</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29-Aug 3b</td>
<td>2.39</td>
<td>1.07</td>
<td>1.32</td>
<td>2</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29-Aug 4</td>
<td>2.39</td>
<td>1.07</td>
<td>1.32</td>
<td>2</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

| 8-Sep 1     | 1.25       | 0.89              | 0.361                 | 5                     | 24               | n/a            | 0                   | 0              | 0              | 0                |
| 8-Sep 2a    | 1.25       | 0.89              | 0.361                 | 5                     | 26               | n/a            | 0                   | 0              | 0              | 0                |
| 8-Sep 2b    | 1.25       | 0.89              | 0.361                 | 5                     | 26               | n/a            | 0                   | 0              | 0              | 0                |
| 8-Sep 2c    | 1.25       | 0.89              | 0.361                 | 5                     | 24               | n/a            | 0                   | 0              | 0              | 0                |
| 8-Sep 3a    | 1.25       | 0.89              | 0.361                 | 5                     | 28               | n/a            | 1                   | 0              | 0              | 2                |
| 8-Sep 3b    | 1.25       | 0.89              | 0.361                 | 5                     | 25               | n/a            | 0                   | 0              | 0              | 2                |
| 8-Sep 4     | 1.25       | 0.89              | 0.361                 | 5                     | 22               | 0.281          | 0                   | 0              | 0              | 0                |

| 14-Sep 1    | 1.09       | 0.89              | 0.205                 | 11                    | 18               | n/a            | 0                   | 0              | 0              | 0                |
| 14-Sep 2a   | 1.09       | 0.89              | 0.205                 | 11                    | 22               | n/a            | 0                   | 0              | 0              | 0                |
| 14-Sep 2b   | 1.09       | 0.89              | 0.205                 | 11                    | 20               | n/a            | 0                   | 0              | 0              | 0                |
| 14-Sep 2c   | 1.09       | 0.89              | 0.205                 | 11                    | 15               | n/a            | 0                   | 0              | 0              | 0                |
| 14-Sep 3a   | 1.09       | 0.89              | 0.205                 | 11                    | 19               | n/a            | 1                   | 0              | 0              | 2                |
| 14-Sep 3b   | 1.09       | 0.89              | 0.205                 | 11                    | 19               | n/a            | 2                   | 0              | 0              | 0                |
| 14-Sep 4    | 1.09       | 0.89              | 0.205                 | 11                    | 18               | n/a            | 0                   | 0              | 0              | 0                |

| 21-Sep 1    | 1.54       | 0.975             | 0.565                 | 2                     | 21               | 1.75           | 1                   | 0              | 0              | 0                |
| 21-Sep 2a   | 1.54       | 0.975             | 0.565                 | 2                     | 23               | 0.529          | 0                   | 0              | 0              | 0                |
| 21-Sep 2b   | 1.54       | 0.975             | 0.565                 | 2                     | 22               | 0.507          | 4                   | 0              | 0              | 0                |
| 21-Sep 2c   | 1.54       | 0.975             | 0.565                 | 2                     | 13               | 1.07           | 3                   | 0              | 6              | 0                |
| 21-Sep 3a   | 1.54       | 0.975             | 0.565                 | 2                     | 16               | 0.454          | 4                   | 0              | 6              | 0                |
| 21-Sep 3b   | 1.54       | 0.975             | 0.565                 | 2                     | 24               | n/a            | 2                   | 0              | 6              | 0                |
| 21-Sep 4    | 1.54       | 0.975             | 0.565                 | 2                     | 20               | 0.765          | 0                   | 0              | 0              | 0                |

| 25-Sep 1    | 1.34       | 0.971             | 0.369                 | 2                     | 21               | n/a            | 6                   | 0              | 5              | 0                |
| 25-Sep 2a   | 1.34       | 0.971             | 0.369                 | 2                     | 19               | n/a            | 4                   | 0              | 4              | 0                |
| 25-Sep 2b   | 1.34       | 0.971             | 0.369                 | 2                     | 20               | n/a            | 4                   | 0              | 1              | 0                |
| 25-Sep 2c   | 1.34       | 0.971             | 0.369                 | 2                     | 18               | n/a            | 1                   | 0              | 5              | 0                |
| 25-Sep 3a   | 1.34       | 0.971             | 0.369                 | 2                     | 18               | n/a            | 95                  | 0              | 16             | 0                |
| 25-Sep 3b   | 1.34       | 0.971             | 0.369                 | 2                     | 17               | n/a            | 31                  | 0              | 0              | 0                |
| 25-Sep 4    | 1.34       | 0.971             | 0.369                 | 2                     | n/a              | n/a            | 0                   | 0              | 0              | 0                |

| 29-Sep 1    | 1.63       | 0.947             | 0.683                 | 4                     | 0                | n/a            | 48                  | 0              | 27             | 0                |
| 29-Sep 2a   | 1.63       | 0.947             | 0.683                 | 4                     | 0                | n/a            | 58                  | 0              | 0              | 0                |
| 29-Sep 2b   | 1.63       | 0.947             | 0.683                 | 4                     | 0                | n/a            | 47                  | 0              | 0              | 0                |
| 29-Sep 2c   | 1.63       | 0.947             | 0.683                 | 4                     | 0                | n/a            | 61                  | 1              | 0              | 0                |
| 29-Sep 3a   | 1.63       | 0.947             | 0.683                 | 4                     | 0                | n/a            | 171                 | 0              | 0              | 0                |
| 29-Sep 3b   | 1.63       | 0.947             | 0.683                 | 4                     | 0                | n/a            | 160                 | 0              | 0              | 0                |
| 29-Sep 4    | 1.63       | 0.947             | 0.683                 | 4                     | 0                | n/a            | 65                  | 0              | 0              | 0                |

*RIFE ~ rain induced flow event.
*Note September 29 pink enumeration info is based from BC Hydro adult enumeration program Oct 2, 3 2007 finding.
3.2 REACH 2 ~ INDEX SITE 2A,

Access to this site is at the foot of Prairie Avenue, Port Coquitlam (49’ 16.276 N – 122’ 47.075 W). This index passage site is identified as a low gradient (0.5%), and channel, flow is evenly distributed across the 22m channel width providing an average depth of 0.23 m (Figure 6). Wetted width decreases to 17m and an average depth of 0.2 m during flows less than 1.35cms and during extreme low flows of less than 1.1cms, cobble and boulder clusters below index site are exposed, decreasing available habitat.

![Figure 6](image)

Figure 6 –Upstream of Lougheed crossing, Aug 29, 07 - shallow wide area – flow 2.3cms (WSC).

No pink salmon were observed at this index site at anytime during survey days, however some adults were observed holding September 19 and 26 by BC Hydro adult enumeration crew upstream of this index site suggesting that mainstem discharge of 1.3cms and as low as 1.1cms (WSC) did not impede migration (Table 2). It is assumed that few spawners were observed at this index site because of habitat characteristics, such as lack of pool and boulder structure and low water depth provide minimal refuge or spawning habitat, it is assumed that spawners might navigate through this index site quickly, or at night.
3.3 **Reach 2 ~ Index Site 2b,**

Index site extends upstream 120m and downstream 75m of Patricia pedestrian bridge (49’ 16.585 N – 122 46.620 W). This site is characterised by a wide, shallow riffle, and a low gradient area that extends the width of the channel (25m) (Figure 7). Downstream the left bank of the river is dominated by scattered large rock and cobble which is dry during low flows (Figure 8). Wetted width is 20.3m and the average depth during the lowest flow of 1.09cms (WSC) was 0.21 m. Nominal increases in water velocity and depth were noticed during precipitation events which occurred infrequently during monitoring period (<14 days precipitation). No pink salmon were observed holding at this index site, although pink adults were monitored upstream of this index site September 19 and 26 by BC Hydro adult enumeration crew during which the average flow rate was measured at 1.34cms (WSC) (Table 2).

![Figure 7 – Index site 2b - upstream view, Sept 21, flow 1.54cms (WSC).](image-url)
3.4 **REACH 2 ~ INDEX SITE 2C**

This index site is located 85m downstream of Galette Park access (49’ 19.621 N – 122’ 46.346 W). This site was identified to potentially constrict migration, due to braiding around a gravel bar on left bank to mid side of the channel (Figure 9). A shallow riffle on the right side of the gravel bar may also have the potential to impede access at low flows (Figure 10). Wetted width decreases at riffle area to 7m; depth also decreases significantly to 13cm at a flow of 1.5cms. The first pink spawners holding in a group were observed Sept 21 and 25 above and below this index site, access for migrating spawners was primarily thru a narrow channel, left bank side of the gravel bar (Figure 9) which had a sufficient depth of 0.37m. During precipitation events occurring September 21 -29 (figure 4), a discharge rate increase was monitored from 1.54 – 1.63cms (WSC) with a precipitation amount of 25mm. It was observed that pink spawner migration primarily occurred after precipitation influenced flow events as migrating pink spawners were observed upstream of this index site beginning September 19th (Table 2). It was observed that moderate increases to flows instigated migration and increased pink adult numbers in the upper Coquitlam River, as monitored by BC Hydro adult enumeration data.
Figure 9 – Index site 2c - downstream view Aug 29, 07 - flow 2.3cms

Figure 10 – Index site 2c - exposed gravel bar, Sept 29, 07, flow 1.63cms (WSC).
One pink spawner was observed constructing a redd upstream and two pink adults were observed holding below this index site on September 29 with a discharge rate of 1.63cms (Figure 10) and (Table 2).

![Redd construction upstream of Index site 2c, Sept 29, 07.](image)

**Figure 11** - Redd construction upstream of Index site 2c, Sept 29, 07.

### 3.5 REACH 3 ~ INDEX SITE 3A

Access to site 3a is at Upper Coquitlam River Park (49’ 19.632 N – 122’ 46.344 W), this index site is characterised as short shallow riffle area with a gradient of approximately 7% (Figure 12). During low flow the substrate in the riffle area is unstable and becomes exposed providing an average depth of 0.17m and riffle area of 9m in width. Low flow causes the cobble gravel bar to be exposed splitting and braiding the channel flow (Figure 13). Dominant flow is confined to the left bank of the channel with access upstream potentially impeded at the end of the bar due to channel constriction. More than 60 pink salmon were observed holding below this constriction during September 27 and 29, 2007. No pink salmon were observed migrating during monitoring days, although approximately 30 or more pink spawners were observed holding upstream of this site in late September by BC Hydro adult enumeration monitoring crew (Table 2). Fish distribution observed during monitoring period indicated this index site does not impede passage at low flows of 1.1cms (WSC).
Figure 12 - View upstream of Index site 3a Sept 25, 07 flow- 1.34cms (WSC).

Figure 13 - Passage index site 3a, Aug 29, 07, Flow 2.3cms (WSC).
3.6 REACH 3 ~ INDEX SITE 3B,

This index site was identified by Jarvis (2001) as having the potential to constrict migration access at a narrow section downstream of the Port Coquitlam fish hatchery (49’ 20 .251 N – 122’ 46.263 W). Observations by the author (2001- present) suggest in recent years dominant flows have transferred to the left bank, leaving a large rock and boulder island in the center of the channel (Figures 16). Passage is a concern within the right bank channel that runs the length of the island bar upstream 200m (Figure 14). No pink spawners were observed holding or migrating at this index site during monitoring period (Table 2).

Figure 14 – Index site 3b - confined chute - 25cm jump - flow 1.34cms
BC Hydro adult enumeration crew observed 16 pink salmon upstream of this index site on September 26, 2007. During this time, discharge ranged from 1.3cms - 1.6cms (WSC) with minimal precipitation input. It should be noted that this index site is primarily influenced from Coquitlam dam releases and Or Creek.
3.7 **REACH 4 ~ INDEX SITE 4,**

This index site is located at the Coquitlam mainstem and Swoboda channel confluence (49’ 21. 041 N – 122’ 46.452 W). The area of concern is a 20m by 6.2m wide cobble/gravel bar that is exposed providing a short riffle with a 7% gradient and a jump height of 0.15 – 0.22m (Figure 17). The mainstem is primarily influenced by Coquitlam Dam releases (Figure 4) and although there is a short unnamed tributary entering the river on the upstream left bank side, flow contribution was observed to be minimal. The lowest flow observed in the mainstem channel was 0.89cms with flow distribution across the riffle (figure 18) becoming braided and the dominant flow transferring to the right bank providing a narrow channel that pink adult can access and migrate upstream (Figure 19). The average discharge during the monitoring period at index site 4 was 0.958cms with periodical precipitation events increasing flow temporarily. During early October, BC Hydro adult enumeration crew indicated that pink salmon successfully accessed Swoboda channel and the mainstem of the Coquitlam River; however, no pink adults were observed holding or migrating at this index site during monitoring dates (Table 2).

![Figure 17 - Mainstem view at Swoboda/Coquitlam confluence, Aug 29, 07 - flow 1.07cms](image)
Figure 18 - Mainstem Coquitlam at Swoboda channel

Figure 19 – Index site 4 - side channel access at index site Sept 25, 07, flow 1.34cms.
4.0 DISCUSSION

During the assessment of pink salmon passage in the mainstem Coquitlam River, low flow conditions occurred when the reservoir release gate valves at the Coquitlam Dam were shut from September 7th to 19th for maintenance. A temporary pump station was established with a max flow contribution of 0.89cms (Hunter 2007) to the mainstem Coquitlam River, the average river discharge recorded during this time was 1.18cms and pink spawner migration was minimal at this time. Figure 4 illustrates that the contribution from Coquitlam dam release is crucial during early migration periods of low tributary flows and minimal precipitation. The mean annual discharge (MAD) has been estimated at 4.6cms (Coquitlam Watershed Atlas 2003), however, during the August 25 – September 31, 2007 monitoring period the average discharge rate was 2.16cms representing 47% of Coquitlam MAD. Under present Coquitlam Dam release operations of Treatment 1 including pumped flow contribution the index sites averaged a daily flow of 1.78cms during the 2007 monitoring period and at no time was migration observed to be impeded at index sites. As indicated in the 2006 Coquitlam River Fish Monitoring Report (Decker et al. 2006), evidence of impeded migration for spawning adults was not apparent at any time during the 2002-2006 surveys. Preliminary data collected during 2007 monitoring period indicates that during the lowest flow of 1.09cms there were zero days of impeded migration at index sites. A significant rain event occurred September 29th and 30th and increased discharge in the mainstem Coquitlam to 21.2cms (WSC) for a thirty hour period, monitoring was discontinued as the ability to observe was hindered by high flow and poor visibility.

Unfortunately pink spawner return numbers have declined from 3,817 in 2003 to 2,349 in 2005 (Macnair, Lewis 2005), present count is estimated at <1500 spawners. Historically early run pink salmon were recorded migrating in numbers mid to late September, peaking in mid October and finishing by late October (Decker et al. 2006). Escapement numbers for 2007 were very low and most of the pink spawners observed were reported from the BC Hydro adult enumeration monitoring program data (Macnair 2007).

Although monitoring indicated there are no passage issues in mainstem Coquitlam, low flows do have the potential to affect off channel habitat use and may limit or restrict access to these
sites. Off-channel habitat use has been decreasing within the present flow regime and possibly, attributed to declining pink salmon return numbers (Decker et al. 2006).

During the 2007 monitoring, there was no migration access issues observed during the Treatment 1 minimum discharge rate. Flow requirements under Treatment 2 may improve access and ease of migration in mainstem Coquitlam River and also increase available spawning habitat for early migrating pink spawners.
5.0 REFERENCES CITED


Henwood, S. 2007. Coquitlam Precipitation data September 2007, Douglas College Geography Department. Personal and e-mail communication


