

## **DFO PUNTLEDGE RIVER COMMITTEE**

### **1998 FINAL FIELD SUMMARY**

#### **OVERVIEW:**

The 1998 Puntledge River program was a continuation of activities from 1996 and 1997. The program was based on the recommendations of the Puntledge River Seal Predation Sub-Committee which, in turn, was formed under the initiative of the Comox Valley Watershed Assembly. The 1997 program is outlined in "DFO's Action Plan in Response to the Puntledge River Seal Predation Committee Report", completed and submitted in February 1998. This summary chronicles the efforts on behalf of DFO staff from this spring to the end of October 1998.

We began the 1998 season in April-May with an assessment to determine the effectiveness of last autumn's cull at eliminating seals that had previously been identified as habitual river foragers and were targeted in the cull. Because very few carcasses were recovered during the cull and because the cull extended into the beginning of the pink and chum runs when there is an influx of non-habituated animals, it is not known how many of the targeted seals had actually been eliminated.

It was decided early in the year that in addition to continuing the cull, further non lethal methods would be implemented to afford as much protection as possible to returning summer run chinook and steelhead. This took the form of a major barrier fence completely spanning the river at the 17<sup>th</sup> St. bridge in an effort to deter seals from gaining upriver access.

The following summary provides an update, conclusions and recommendations on each of the elements addressed by DFO during this 1998 season.

#### **1. Spring Assessment:**

The number of individual seals foraging on outmigrating fry and smolts was reduced from the 40-45 animals identified prior to the cull to about 10-12 following the cull. There was little or no influx of new seals to replace those culled last fall. As a result, the number of seals foraging on fry and smolts in the spring of 1998 was reduced by approximately 65-70% over pre-cull levels.

## **2. Barrier Fence:**

The fence was based on a broomstick design and consists of a number of vertical aluminium panels. It is of a floating design to accommodate tides and has an opening section to accommodate vessel traffic. Installation was completed and the fence was considered operational on June 19 however, there were a number of initial problems due to fence design and a couple of seals breached the fence. One of these seals was culled on June 5. The barrier was considered seal proof on June 29. There were other problems with build up of algae due to the warm water in the river. The algae had to be removed on a continuous basis. This would not present a problem if the fence were to be installed in the spring of 1999 due to much reduced water temperatures at that time. Costs for reinstallation are unknown at this time.

An acoustic deterrent device was installed immediately below the fence and was in constant operation from the outset of the installation to mid August. At that time it was turned off because it was determined to be ineffective. Observers were positioned at the fence 24hrs/day, 7days/week to monitor fish migration and behaviour and to observe seal activity and foraging habits. Data was collected on an hourly basis. The fence was removed completely by mid-October.

## **3. Seal Foraging Effort Observation Program:**

An assessment of seal foraging levels was conducted during the return of summer chinook to determine the extent to which levels had been reduced by last year's cull, and to establish whether those seals culled would be replaced by others. During the first week of July, foraging levels were 44% of those observed during the same period in 1997, which was similar to the foraging levels observed during the fry/smolt outmigration 3 months previously. However, foraging levels increased to 49% of pre-cull levels during the

second week of July, and to 110% of pre-cull levels by the 3<sup>rd</sup> week of July. Numbers of animals foraging in August in the river were not significantly different than levels observed during previous years.

The influx of seals was likely attributable to the early arrival of the 1998 pink run. Assessments in previous years have shown that many other animals in the river on an occasional basis join the habitual river foragers when large pink and chum runs arrive. Because the influx of seals quickly replaced those culled, the number of summer chinook estimated to have been killed was roughly 70% of the number killed in 1997.

#### **4. Cull and Adult Salmon Mortality:**

Other than the initial seal culled for breaching the fence on June 5, the following criteria were used to begin the cull. If 40 chinook kills were observed either at the fence or immediately below or 10 chinook kills were observed within 100m. of the fence the cull would be initiated. The number of seals culled in 1998 was 21. The majority (70%) of those animals recovered from the cull were not identified as habitual river foragers, and none of those recovered had been feeding on chinook (all stomachs with prey contained only pink salmon). Since most of the animals culled were non-habitual river foragers which exhibit very high turnover, the long-term benefits of culling in the estuary is likely minimal. However, it could be interpreted that the combination of the fence and this year's cull did provide some benefit in that 8 confirmed habituated animals were further eliminated as part of the year's cull and no opportunity for upstream foraging existed.

#### **5. Habitat Issues:**

The temperature regimes throughout southern British Columbia were an anomaly in 1998. They were extremely high and lasted well into September when adults were taken into the hatchery facility for spawning. As a result, water temperatures in the Puntledge River rose very quickly to 23 C. and maintained this level through the entire migration of summer run chinook. The high water temperatures most certainly caused delays in migration, particularly through the barrier fence and made the fish more vulnerable to predation by seals. It was noted that the summer chinook run showed up somewhat earlier than average. A question that arises is whether or not there was a later part of the run that may not have materialized because of high temperatures, never existed or inadvertently got counted as fall chinook.

Dredging activities at the adjacent sawmill took place during the expected migration peak. The effect of this activity is not known.

## **6. Cost of the 1998 Program:**

The actual costs of constructing, installing and removing the barrier fence was \$200 K. Other costs include salary dollars for DFO personnel, some equipment costs and the contribution made by HRDC through the local Commercial Fishermen's Adjustment Centre. A rough estimate of the cost would be \$600 k for 1997 and 1998 excluding HRDC's contribution. This includes all costs for both Operations and Science programs during this time.

## **7. Escapement to Date:**

- Summer run Chinook – 159 males, 77 females, 43 jacks, i.e. 236 mature adults. Of these totals 139 males, 69 females & 36 jacks were handled and spawned in the hatchery site. The remaining 20 males, 8 females & 7 jacks were left to spawn naturally. This run size represents ~ 33% return of the 10 yr. Average.
- Summer run Steelhead – only 11 in total were counted in the river all season. These were left to spawn naturally.
- Fall run Chinook – 173 males, 88 females & 55 jacks to present. 75 were left to spawn in the river. (50 males, 25 females).
- Coho – 4300 adults & 2800 jacks to present.
- Pinks – est. 10, 000 adults to present.
- Chum – 180,000+ to present.

## **8. Conclusions:**

- A number of conclusions can be made following the 1998 field program. In some areas data analysis is required.
- The number of seals observed feeding this spring (10-12) on outmigrant smolts compared to 1997 (40-45) suggests the 1997 cull of 31 animals provided a reduction in smolt mortality by seal predation of 65-70%.
- The number of seals observed foraging on adult chinook during the first week in July was also reduced over pre-cull levels, but by the 3<sup>rd</sup> week in July had returned to pre-cull levels where it remained throughout August

which suggests that seal predation levels in the lower river were similar to 1997 level due to seals moving in from the estuary.

- The very high water temperatures experienced this summer and the reluctance of fish to move quickly through the barrier fence made it difficult to draw a quantitative conclusion as to the effectiveness of the fence. However, once fish were above the fence they were certainly out of harm's way and were able to continue up the river. Once the fence was installed seals did not have access to the river and were effectively blocked. The question remains: to what degree did the fence and high water temperatures slow down the migration into the river and were fish more vulnerable to predation at that time than if they could have moved up unimpeded? It is the collective consensus of the committee that the fence did provide a measure of safety and sanctuary to migrating salmon, based on the behaviour of seals when encountering the fence.
- The effectiveness of the concrete triads at this time has been extremely hard to evaluate. They will have to be observed over a time series to obtain meaningful data.
- Based on the carcasses recovered from the 1998 cull and examined to date (there are still 4 carcasses to be examined), it is estimated that roughly 8 of the 40-45 habitual foragers were removed in addition to the 31 that had been eliminated in 1997. Assessments indicate that turnover rates for seals foraging on fry/smolts (a highly specialised behaviour) are low, so the cull is expected to have longer-term benefit on this type of predation. Conversely, assessments indicate that turnover rates for seals foraging on adult salmon (a generalised behaviour) are high suggesting the cull will provide minimal benefits at reducing predation on migrating adult salmon.
- The habitat factor in this whole endeavour cannot be **understated**. Continuing culls in the future cannot compensate for continuing high water temperatures and contaminated tributaries (Tsloum). Furthermore, it is futile to take expensive mitigative actions such as the erection of a fence and expect wild stocks to recover and rebuild in the face of poor fish habitat availability.

## **RECOMMENDATIONS:**

1. **First and foremost**, both the long term and short-term approaches to the habitat restoration programs have to move forward. These elements have been identified for a number of years but no measurable progress has been made. Our

Committee recommends that prior to any further significant expenditures or initiatives in the Puntledge River that the Habitat Subcommittee of PSARC undertake an assessment to determine whether the habitat in this river is capable of supporting chinook in its present state, and if not what modifications in the short and long term have to be made. Some of these major habitat issues include; the need for a long term cold water supply during the summer period, increased logging activity in the Puntledge and Tsolum watersheds planned for the next several years, increasing urbanization, degradation of the estuary, farm land erosion in the lower Tsolum, high contaminant levels in seals and adjacent habitats and runoff from the Mt. Washington mine, to list a few.

2. Continue funding of Tsolum River Task Force and the Estuary Management Program to maintain liaison with all concerned parties.
3. Operations and HEB advocate that during the smolt migration in spring of 1999 determine if any of the habituated seals return and if there are any new seal recruits. If it is determined that there are remaining problem seals a cull will be conducted immediately with all safety procedures in place. The committee could not reach consensus on the direction to be taken this spring. In contrast Science Branch advises that ~ 90% of animals identified as river foragers have been eliminated and such an assessment would be of little value and does not warrant the cost and effort involved. Since seals foraging on adult salmon appear to be replaced much more rapidly than those foraging on fry and smolts it is unlikely that a spring time cull will have any benefit in protecting adult chinooks arriving in the summer. Further Science Branch advocates another option for the spring would be to shield the lights on the 17<sup>th</sup> St. bridge or perhaps turn them off completely during the critical smolt outmigration time frame. The city does not favour turning out the lights completely for obvious liability concerns however a previous assessment suggests that these lights could be shielded for a cost of ~ \$ 3500. This advice is consistent with the recommendation to evaluate light management as a mitigative measure which was made to and accepted by PSARC and subsequently endorsed by RMEC.
4. Maintain local strenuous conservation based management measures throughout adjacent fisheries for the 1999 season.
5. Install the remaining partially constructed 30 habitat Triads to complete this program (estimated cost - \$3K). As well, continue the monitoring of this phase of the program into next year to begin building a data set.

6. Collect and analyze DNA samples from fall run chinook to determine if these are survivors of original stock.
7. Maintain this internal DFO Puntledge River Committee, at least until decisions for next season have been made and perhaps beyond, if required.

**Special note:**

A special note of gratitude is made to the Commercial Fishermen's Adjustment Centre, HRDC, Field Sawmills, Ministry of Highways, Parker Marine and the communities of Courtenay/Comox for their assistance provided to DFO for this year's delivery of the program.