

Yukon Salmon Sub-Committee Submission to Yukon Mineral Development Strategy

Executive Summary

- The Yukon Umbrella Final Agreement established the Yukon Salmon Sub-Committee (YSSC) as the main instrument of salmon management in the Yukon, which includes the management of salmon habitat.
- Our submission focuses on salmon habitat in the Yukon River Watershed in the Yukon.
- Yukon River Chinook salmon spawning distribution is relatively well known. Less is known of Yukon River Chinook juvenile rearing and overwintering distribution. To properly manage and sustain Yukon River Chinook salmon, we need better information on Chinook salmon rearing and overwintering habitat.
- At this point in time, Yukon River fall chum salmon habitat is relatively safe from mineral development. We need to ensure this remains the case going forward.
- As a first principle the YSSC believes that, to the extent practicable, human activities should not result in additive and appreciable amounts of sediment or the release of ground or surface waters high in dissolved substances to salmon habitats.
- The YSSC does not believe that salmon habitat is properly addressed or protected by current Yukon Placer stream classifications.
- For both Placer and Quartz mining, streams, rivers and tributary waters that have not been mined or are not currently being mined should be subjected to a comprehensive aquatic inventory prior to mine development to determine whether Chinook salmon habitat is at risk.
- All mines should provide financial security that will pay for the reclamation of the site if proponents are unable or unwilling to do so.
- Off-site infrastructure for exploration and mining, including roads and any electrical transmission lines, should be designed and built to effectively mitigate effects to salmon habitat.

In short, the Yukon Mineral Development Strategy should ensure that Yukon salmon habitat is properly identified and protected.

Introduction

The YSSC entered your process late. We are inadequately funded to carry out reviews of this nature, but considered that the Strategy was important to contribute to. We do

not have access to the data held by government departments or to the graphics and models of the professional Non-governmental Environmental or Industrial Organizations. Despite this we consider your process of designing a Mineral Development Strategy to be important and ask that our collective voice be heard.

The Yukon Umbrella Final Agreement (UFA) established the Yukon Salmon Sub-Committee (YSSC) as the main instrument of salmon management in the Yukon. The inclusion of salmon habitat is specifically noted in Sub-sections 16.7.17.11; 16.7.17.12(a); and 16.7.17.14. The final Sub-section allows us standing as an interested party in the public proceedings of any agency, board or commission dealing with matters that affect the management and conservation of salmon or their habitats in the Yukon.

The YSSC wish to exercise this standing in contributing to the development of the Yukon Mineral Development Strategy. Please note that we will not address some of the issues raised by other parties that are participating in this process: this is not because we consider the issues they raise to be insignificant. Rather, we are confining our input to salmon as defined by the Umbrella Final Agreement (UFA) and the habitats those salmon use.

Salmon as defined by the Umbrella Final Agreement

The UFA defines salmon as a number of species that include the Pacific salmon. It also defines some anadromous fish that are not generally recognised as "salmon". The specific definition follows:

"Salmon" means Pacific Salmon of the species *Oncorhynchus nerka* including sockeye; *Oncorhynchus kisutch* including coho; *Oncorhynchus gorbuscha* including pink; *Oncorhynchus keta* including chum; and *Oncorhynchus tshawytscha* including chinook; anadromous whitefish and cisco (*Coregonidae* spp.); and anadromous Arctic char (*Salvelinus alpinus*).

Since the UFA was negotiated anadromous Arctic char (sic) are now considered to be "Northern Dolly Varden". We consider anadromous whitefish to include cisco rather than be separate from it. The anadromous Dolly Varden, whitefish and some Pacific salmon inhabit the rivers of the Yukon North Slope, the Yukon portion of the Peel River watershed below the obstruction to upstream fish migration at Aberdeen Falls, and possibly in the Yukon portion of the Liard River watershed.



The YSSC have concentrated our efforts on the Pacific salmon of the Yukon, Porcupine and Tatshenshini River watersheds. We are aware of the possible Climate Change induced melting of the toe of the Tweedsmuir Glacier in British Columbia. This may mean that the upper Alsek River watershed, and particularly the Dezadeash River and its tributaries, will become accessible to salmon

In our submission, our input will be focused on salmon habitat in the Yukon River Watershed in the Yukon. Our reasons for this focus is that the Tatshenshini Watershed is rich in salmon but of limited geographical extent. It is largely administered as a National Park and much is owned by the CAFN. The Porcupine River Watershed is managed by the North Yukon Land Use Plan. Mineral development will be considered under the NYLUP.

Mineral Development

The YSSC recognizes that mining and its supporting industries are important to the Yukon. We agree that a collective strategy for the management and administration of placer and quartz mineral prospecting, exploration, development, production, reclamation, closure and post-closure funding and related activities is advisable. We believe that off-site physical, administrative and managerial infrastructure should also be considered in the Strategy where they contribute to or support mineral development.

We relied on the knowledge of YSSC members to prepare this document. Our members have considerable experience in Indigenous, Scientific/Technical and commercial aspects of salmon in the Yukon. In some cases individual members have more than half a century of experience in which they learned of our salmon and their habitats. As a Land Claims advisory body, we provide consideration of traditional, local and scientific knowledge gathered by governments, agencies and others. Further, many of us have also worked in one or more aspects of mineral development and have also contributed our knowledge of the industry.

Our input reflects our knowledge and experiences. We do our best for Yukon salmon and their habitats during our periods of appointment.

We assume that DFO will contribute to your process. They have prepared a series of draft or interim documents to guide mineral development and other proponents through typical water related project activities. On a strategic level, we understand that a single set of documents will be prepared for all of Canada. Each area of Canada will have to meet the requirements of the same document. Our country extends over 40 degrees of latitude and 90 degrees of longitude. The fish species are not the same over these



great distances. The fish species' use of the habitats available to them will vary. Importantly, the stressors that effect habitats will also vary: in southern Canada heat will be a primary stressor and shading of streams will be critical. In the north, biological productivity of streams will be limited by low sun angles. Streams that are open to the sky will generally be more favourable fish habitat. The Yukon is at particular risk in trying to meet requirements that best serve southern Canada.

Inclusion of salmon habitat related material may enter the administration processes of lands and water management at different stages. Broadly, DFO can enter at a planning stage or during project review. DFO has entered when an application for a *Fisheries Act* Authorization has been made and a project review initiated. The processes to be followed by DFO in the administration of the newly amended *Fisheries Act* in respect of Yukon mineral development should be clarified.

Salmon Habitat

Fish Habitat is defined in Section 2 of the *Fisheries Act* as:

fish habitat means water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas.

The YSSC is interested in salmon habitat in the Yukon. These are the streams, rivers and lakes known to be utilised by salmon or likely to be so.

The Yukon River Chinook salmon spawning distribution is relatively well known. Spawning has been observed in 104 streams and rivers. Eggs are incubated over the winter. Juveniles emerge as fry from river bottoms in the spring. Some stay in the stream of their birth (natal) for the summer and migrate to the sea in the following spring. Other fry move downstream to ascend non-natal tributaries. They overwinter in these tributaries and descend to the sea in the following spring. We do not know how many juveniles move downstream to the sea from the Yukon in any given year.

Many streams have been sampled for juvenile salmon use and distribution over the past 50 years. Most have only been sampled on a limited number of occasions or only once. The total extent – as in how far a juvenile Chinook salmon could migrate up any given stream in any specific year – of upstream migration by young-of-year Chinook fry in natal or non-natal streams is not well understood. Additionally, our rapidly changing climate is affecting streams and, as a consequence, salmon habitats. Specific field investigation of individual streams will have to be conducted to determine this. A



program of field investigations was conducted by DFO of placer streams from the mid-1980s to the mid-1990s in support the *Fisheries Act* Yukon Fisheries Protection Authorization and the Yukon Placer Authorization. These investigations may form a baseline for future work.

Yukon River fall chum salmon spawn only where warm, high quality ground water discharges into standing or moving water. These discharges are found in main and side channels of rivers, at the toes of alluvial fans and occasionally in lakes. The fry go to sea immediately after emergence.

Occurrences and Actions

Salmon habitats tend to be thought of as ending at or near the high water mark of streams, rivers and lakes or some undefined riparian zone. A more holistic view includes the effects of occurrences and activities on upslope areas that may- or will drain to salmon habitat. We define "occurrences" as those naturally occurring and "activities" as the works or undertakings of humans.

We recognise that the line between occurrences and activities is not clear: the Yukon is largely clear of human control of landscapes and watersheds. We expect that there will be occurrences of large and persistent releases of sediment. They result from permafrost melt or land slippage as mediated through wild fire or otherwise. The structure of streams may change as a result of increased deposition of boulders, gravels and other sediments from the melting or failing ground surface. This will affect the depth and width of stream channels and the forests on the valley floor.

The melting of thermal aquicludes will occur. An "aquiclude" stops the underground movement of water. When the aquiclude is composed of permanently frozen soil or ice, melting may result in a sudden outwash of water followed by a period of slow seepage. The water will often be rich in dissolved substances and may be deleterious to fish. Other occurrences will occur in areas of seepage from mineral rich ground.

These occurrences are happening and will continue to do so. Many will have no measurable effect on salmon habitat. A small number will affect salmon habitats profoundly: as an example, an occurrence on Crooked Creek (tributary of the Stewart) has turned the formerly clear Chinook spawning river turbid for the last few years. The gravels on the river bottom have been filled with sands and silts.

As a first principle the YSSC considers that, to the extent practicable, human activities should not result in additive and appreciable amounts of sediment deposited in salmon



habitat. They should not result in the release of ground or surface waters high in dissolved substances to waters utilized by salmon. Those activities that may result in the persistent and uncontrolled releases of sediment at or upstream of salmon habitats should be anticipated and either avoided or controlled. Similarly, those activities which may change the stability of river channels should be avoided. Of particular importance are acid rock drainage occurrences that have been increased by the activities of mineral development. As mineral development proceeds these releases may become acid mine drainage. They may result from excavation, waste rock disposal or tailings and may persist for centuries.

Yukon Placer

The present Yukon Placer Mining administrative process includes classification maps. The maps were generated by computer and in some cases appear to have been amended by hand. The classification was determined as follows:

“In this fish habitat classification system, the suitability of fish habitat is determined by considering watercourse gradient, the proximity of streams to the routes used by Chinook salmon for spawning and migration, and water quality. This approach has proven to be effective when assessing habitat in streams not affected by human activity....”

The YSSC is not satisfied that the protection of salmon habitat is addressed by the computer generated placer classifications. We have not seen the rationale on which the statement regarding the effectiveness of the approach in assessing streams not affected by human activity. We believe that use of the current Yukon Placer Classification maps should be confined, in the short term, to those areas of the Yukon in which placer mining has taken place, continues to be active and has made irrevocable changes to the land surface of stream valleys. The majority of these areas have already been mapped. For clarity, most of the tributaries to those areas should also be considered to be part of the Yukon placer inventory.

We do not believe the current Yukon Placer Classification maps should be used in areas of the Yukon in which placer mining has not taken place, is not active and has not made irrevocable changes to the land surface of stream valleys.

Streams, rivers and tributary waters that have not been placer mined should be subject to aquatic inventory prior to mining to determine whether juvenile Chinook salmon can utilize them. The inventory should use acceptable techniques and be conducted at an appropriate time of year. They should be conducted by trained government staff or



consultants. It should include a field check to ensure that there are no obstructions between the mining area and a river of known salmon utilization. The findings of the inventory would then inform the design of the mining plan.

A vision for the future of placer mining should be developed that includes some form of declaration of exhausted ground and withdrawal of staking. We recognise that mined out ground may be used for other purposes such as settling ponds, camps, etc. The process of withdrawal from staking should be carried out respectfully over a reasonable timeframe and be organised on a watershed basis.

We must also note that the present Classification system penalizes and constrains the placer mining industry. As part of a Stream Stewardship project conducted by the Dawson District Renewable Resources Council, nine small northward flowing creeks with moderate-high placer classifications between Flat Creek and Henderson Corner were identified from the Klondike stream classification map. These creeks are considered to be "highly suitable for rearing Chinook salmon". However, only seven creeks could be found to be crossing the Klondike highway. The seven creeks were sampled between 2012 and 2017. Captures of juvenile Chinook were limited to a single creek. The creek was obstructed immediately above the Highway, as it had no defined channel. All of the other creeks entered the Klondike River valley and then dispersed into wetlands or flowed underground before entering the Klondike River. The classification maps were protecting habitats that juvenile Chinook salmon simply did not use and had not used for centuries or millennia.

Finally, the Placer Classification system has been proposed as an accurate depiction of salmon distribution and habitat use for land use planning purposes. It is entirely unsuitable for this purpose. It gives a false impression of the amount of available juvenile Chinook salmon rearing and overwintering habitat. In some cases it overestimates available salmon habitat by stating that streams with no juvenile salmon use are heavily utilised by them. In other cases, it underestimates available habitats with much lower classifications than DFO's own field sampling would support. This includes the Sixtymile River watershed, where juvenile Chinook salmon distribution was intensively investigated in the 1980s and 1990s.

Yukon Quartz

Most quartz mines will be located upslope of salmon habitat. The important point, in respect of salmon habitat, is that any mineral development is controlled to limit the release of deleterious substances to downslope salmon habitat at any period between



exploration and final closure. An aquatic inventory of all rivers, streams and brooks should be carried out as part of the advanced exploration or early development phase. Chinook salmon should be the focal species with special attention to migration corridors, spawning streams, and juvenile Chinook rearing and overwintering areas.

Most on-site mine structures and processes are – or have been – addressed in the licenses that allowed a mine to be operated. There is, however, some risk to salmon habitat. This is during unanticipated natural events, periods of labour unrest, temporary or permanent closure during which water with deleterious substances may be released to streams or rivers. To address this licenses-to-operate should persist- or new licenses be granted to deal with closure and to monitor and mitigate the effects of it. This assumes that the operator provides sufficient financial security to an independent third party to allow contractors to complete the agreed mitigation works and monitoring. We mention “unable” as the quartz mining industry has been given to periods of high- and low demand for product. On the basis of past experience, temporary closures may become permanent. Large companies can sell mines to junior operators unable to meet their legal obligations in respect of contaminant control or monitoring. The financial obligations fall on the junior operator and the site is abandoned to the Crown.

The YSSC considers this to be unacceptable. All operators of quartz mines should provide financial security that will pay for the reclamation of the site if they are unable or unwilling to do so. The funds should be related to the degree of disruption at the mine site. If reclamation works or undertakings are completed to the satisfaction of whichever representatives of each government deemed responsible for the site the operator should receive credit for it. If the pursuit or process of minerals results in a need for additional funds for reclamation, the operator should provide it. The fund should be indexed to the inflation rate.

Off-site infrastructure for quartz mines includes roads and may include electrical transmission lines. Exploration and early development roads can be built to effectively mitigate effects to salmon habitat. Roads proposed to be located on valley floors should consider the stability of the river channel during the design phase. Any potential icing sites, or areas that have a high risk of being underwater during spring melt should be avoided.

The YSSC believes generally that each new mineral development should generate its own electrical power. Transmission lines to mines should be discouraged. However, we accept that the Yukon Energy Corporation may provide electrical power. If



transmission lines are built for any specific mineral development the abandonment of the line must be considered in the closure. Upon closure, the far smaller electrical load required to operate the monitoring and maintenance can be accommodated by thermal or other generators.

The YSSC looks with great concern on the possible damming up of major Yukon rivers to produce hydro-electricity. It was only a few years ago that Yukon Energy proposed dams on one of the Pelly, Stewart or Teslin Rivers. All are major Chinook salmon rivers and each supports a number of spawning stocks. Moving back in time, the Yukon River was proposed to be dammed at Eagle Nest Bluff near Little Salmon Village. Each of these reservoirs would have been long and shallow when full. They would have been shorter and shallow when drawn down during spring. They would also have been shallow during our occasional droughts, such as the summer of 2019. Upstream adult salmon passage would have been difficult as, unlike the Whitehorse Rapids Dam, the water levels behind the dam would have fluctuated widely. Returning adult salmon would also have had to ascend over the dam during the annual period of maximum daily heating of the reservoirs. Fry and smolting fish would have had to migrate downstream during periods of increased water temperatures. Increased temperatures can make salmon more susceptible to disease, predation or depletion of energy. Exhaustion or death may occur.

Closing Statement

Thank you for allowing us to participate in the renewal of the Yukon Mineral Development Strategy. We appreciate your consideration of the points we have made and would be pleased to discuss them if required. Please contact Elizabeth MacDonald, YSSC Executive Director, at 867-393-6725.

